SEQUENTIAL EXTRACTION OF COPPER (Cu), MAGNESIUM (Mg), MANGANESE (Mn) AND ZINC (Zn) IN A FLOUR RESIDUE OF FRUITS AND VEGETABLES (FFV)

Luana S. Reis, Douglas Felipe C. de Oliveira, Rodrigo A. Gonçalves; Édira C. B. A. Gonçalves.
Food and Nutrition Master Program, Federal University of Rio de Janeiro State – UNIRIO, Av. Pasteur, 296, 22290-240 Urca, Rio de Janeiro, Brazil.

Food residues can be a rich source of minerals. Bioavailability is modified according to the chemical species of minerals. Total metal contents of Cu, Mg, Mn and Zn were analyzed using ICP-MS in three lots of fruit and vegetable flour (FFV) stored for 7 (lot 1), 20 (lot 2) and 60 (lot 3) days. Sequential extraction was applied using the following extractors: CaCl₂ 1.0M (I), HAc 0.5M/ NH₄Ac 5% [pH 5.0] (II), HAc 0.5M (III) and HCl 0.5M (IV), each one was in contact with the sample for one hour. Dixon and t student tests were used. In average, per 100g of FFV, was observed 0.84±0.02 mg copper, 2.38±0.04 mg zinc, 154±2.6 mg magnesium and 3.46±0.61 mg manganese. There was no significant difference between lots. All minerals were present, at least, in 5 different chemical species in the samples. Extractors III and IV showed a significant decrease in lots 2 and 3, from 44 to 78% when compared to lot 1. No significant difference was observed in lot 2 using extractor II. The extractor I promoted an increase for Mg and Mn contents, respectively, 66 and 157%, while no significant difference was observed in lot 3. Differently, with the extractor II a significant increase occurred for Mg, Mn and Zn contents, from 28 to 51%. The recovery rate of metals was 100%. The amount of metals increased in the residue after extraction proportionally to the storage period. Chemical species were modified during storage suggesting an alteration on its bioavailability.