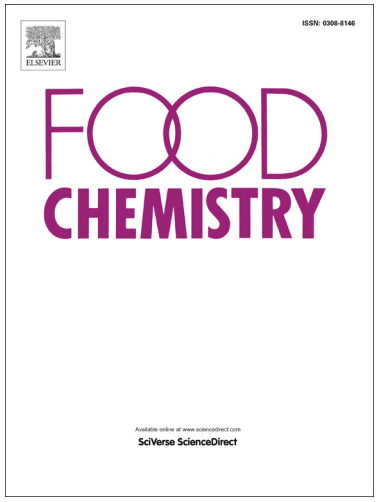

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Development of procedure for sample preparation of cashew nuts using mixture design and evaluation of nutrient profiles by Kohonen neural network

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Abstract: A procedure using ICP OES for sample preparation for the determination of copper, iron and manganese in cashew nuts was developed. Constrained simplex-centroid design was applied in the optimization of the digestion in microwave oven procedure, and the results evaluated from topological maps of the Kohonen network. The best proportion evaluated for the digestion of the sample with HNO_3, H_2O_2 and H_2O was 10:45:45 (%). With optimized conditions, the detection limits were 0.63, 4.3 and 0.37 mg kg^{-1}, and quantification 2.1, 14 and 1.2 mg kg^{-1} for Cu, Fe and Mg, respectively. The precision (% RSD) was 1.84, 2.31 and 2.73, for Cu, Fe and Mg, respectively. The procedure proposed had the accuracy confirmed using NIST 1568b (at 95% reliability) and was applied in the samples obtaining concentrations in the range of 10.7-19.4, 44.3-67.2 and 11.0-21.4 mg kg^{-1} for Cu, Fe and Mg, respectively.

Keywords: Constrained mixture; Kohonen Neural Network; Cashew Nuts and ICP OES