Levels of selected metals in commercially available rice in Ethiopia

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This study reports the levels of metals in commercially available imported (*Oryza sativa*) and Ethiopian rice (*Oryza glaberrima*). The levels of thirteen metals (Ca, Mg, K, Na, Fe, Mn, Zn, Cu, Co, Ni, Cr, Cd and Pb) were determined in six varieties of raw rice collected from Addis Ababa supermarkets, Fogera town and Amahara Regional Agricultural Research Institute and in one selected cooked rice by flame atomic absorption spectrometry (FAAS) after digesting the powdered rice samples with HNO_3, $HClO_4$ and $H2O_2$ mixture. The validation of optimized digestion procedure was evaluated using spiking method and an acceptable percentage recovery was obtained. The levels of metals found in the imported and Ethiopian rice, respectively, were in the ranges (mg/kg): Ca 75.8-630, 205-427; Mg 90.6-150, 99.5-2250; K 1680-2150, 1100-3020; Na 70.6-78.6, 26.7-80.9; Fe 48.9-117, 41.3-113; Mn 4.1-15.5, 3.7-16.6; Zn 16.4-25.7, 15.6-140; Cu 2.7-4.9, 3.3-15; Co 12.6-14.6, 8.8-10.4; Ni 2.5-75.1, 41.5-69.7; Cr 2.2-3.12, 2.32-4.82; Cd <0.34, 0.45-2.54; Pb 2.1-5.3, 0.8-3.8. Comparison between levels of metals in the imported and Ethiopian rice showed significant differences for most of the metals. The results indicated that Ethiopian rice is comparatively rich in essential metals than imported. A statistical analysis of variance (ANOVA) at 95% confidence level for metal determination indicated significant difference between the means of each variety of samples. Comparison between levels of metals in cooked and raw rice showed that the difference in the level is not significant.

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