

## Estimated daily dietary intake of mineral and trace elements in Brazilian worker duplicate diet samples

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Information concerning nutritional status of individuals and populations is essential in order to initiate any necessary intervention. This information is obtained from the evaluation of nutrient requirement measurements, uptake studies and bioavailability of essential elements. Many analytical techniques have been used in food and diet analysis in order to determine a great number of nutritional elements. In this study three analytical techniques (Instrumental Neutron Activation Analysis, INAA, X-Ray Fluorescence, WD-XRF and Inductively Coupled Plasma Optical Emission Spectrometry, ICP OES) were applied to determine mineral and some essential trace element concentrations in diet samples collected in a steel factory in São Paulo city, Brazil. Concentrations of Ca, Cl, Co, Cu, K, Fe, Mn, Mg, Na, P, Se and Zn were determined in 26 duplicate portion diets of a group of male workers aged 19 - 56 from a steel factory. For validation of the methodologies Typical Diet Certified Reference Material (NIST SRM 1548<sup>a</sup>) was analyzed. The concentrations of the elements determined in the diets were used to calculate the daily dietary intake values. The average daily dietary intakes obtained were: 649 ( $\pm$  176) mg Ca/day; 7.7 ( $\pm$  1.9) g Cl/day; 16.8 ( $\pm$ 5.1)  $\mu$ g Co/day; 1.2 ( $\pm$  0.3) mg Cu/day; 12.3 ( $\pm$  3.4) mg Fe/day; 3.2 ( $\pm$  0.8) g K/day; 284 ( $\pm$  62) mg Mg/day; 3.1 ( $\pm$  0.8) mg Mn/day; 4.9 ( $\pm$  1.2) g Na/day; 1.3 ( $\pm$  0.3) g P/day; 40 ( $\pm$  9)  $\mu$ g Se/day and 12.3 ( $\pm$  3.2) mg Zn/day. Mineral and trace element dietary intakes were compared to the Dietary Reference Intakes (DRIs) set by the US Food and Nutrition Board for men ranging from 19 to 50 years. According to the DRI values (AI - Adequate Intake for Ca - 1000 mg/day and Mn - 2.3 mg/day and EAR - Estimate Average Requirement for Cu - 0.7 mg/day, Fe - 6 mg/day, Mg - 330-350 mg/day, P - 580 mg/day, Se - 45  $\mu$ g/day and Zn - 9.4 mg/day), it is suggested that 96% of the male group diets did not reach the Ca AI value while 12.5% did not reach Mn AI value. It was also observed that Se and Mg were adequate for 17% of the diets and Zn was adequate for 88% of the diets. All daily dietary intakes for Cu, Fe and P were adequate in relation to their EAR values. Cl and Na daily intakes were higher than the recommended values for healthy individuals.