

Assessment of daily dietary intake of Hg and mineral elements in diets of children from Amazon Region

L.A. Farias¹, D.I.T. Favaro¹, V.A. Maihara¹, M.B.A. Vasconcelos¹,
L.K. Yuyama², J.P.L. Aguiar², F.J. Alencar²

1. Instituto de Pesquisas Energéticas e Nucleares, IPEN/CNEN-SP, São Paulo, Brazil
2. Instituto Nacional de Pesquisas da Amazônia, INPA, Manaus, Brazil

Mercury is widespread in the environment and it constitutes an important contaminant for populations that depend on fish for daily sustenance. As it is already known the nutritional status of the individual and the dietetic interaction can increase the toxicity of Hg. Body retention of mercury, like other metals is dependent on dietary and physiological factors. The purpose of this study was to assess the daily dietary intake of Hg and some mineral elements in diets of pre-school children from some communities in the Parque Nacional do Jaú (PNJ), Amazon Region. It is known that riverine populations are exposed to mercury through fish consumption. From each community a group of children were chosen and their diets (the total 24-hour consumption) were collected by duplicate portion technique and a pool of diets was composed. Diet samples were analyzed for total Hg concentration by FIA-CV-AAS technique and Neutron Activation Analysis for the determination of some elements concentration: Ca, Fe, K, Na, Se and Zn. The validation of both methodologies was performed by Certified Reference Materials analysis. The results obtained for total mercury concentration in diets ranged from 163 to 803 $\mu\text{g kg}^{-1}$ and the average daily dietary intake ranged from 18 to 81 $\mu\text{g Hg/day}$. The weekly tolerable provisional intake was calculated for each group considering an average of 10 kg of body weight per child and the values varied from 13 to 57 $\mu\text{g Hg/kg}$ of body weight, exceeding the limit of 5 $\mu\text{g Hg/kg}$ of body weight set by WHO. For the other elements, daily dietary intake values were: Ca: 58 to 1505 mg/day; Fe: 2.6 to 11.3 mg/day; K: 277 to 1642 mg/day; Na: 339 to 2298 mg/day; Se: 12 to 54 $\mu\text{g/day}$ and Zn: 1.1 to 5.3 mg/day. When these values were compared to the new dietary reference intakes (DRIs) for the life stage children group - 4 to 8 years, it was verified that for: Fe 60% (EAR - 4.1 mg/day), Se 20% (EAR - 23 $\mu\text{g/day}$), Zn 80% (EAR - 4.0 mg/day), K, 100% (AI - 3800 mg/day), Na, 60% (AI - 1200 mg/day) and Ca 80% (AI - 800 mg/day), of the diets showed the prevalence of inadequacy. It was observed that the highest Hg daily intake was found for the diet that showed the lowest daily intake for Ca, Fe, Se And Zn. Such findings suggest that nutritional education programs should be implemented, aiming at a better use of natural resources.