

**Total Diet Study: Fe, Cr, Zn and Se content estimation of São Paulo State (Brazil) diet by
Instrumental Neutron Activation.**

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Total Diet Studies (TDS) are based on the evaluation of food samples representing a Market Basket, which shows dietary habits of a given population. World Health Organization (WHO) has encouraged countries to conduct their own TDS, which is already being carried out in different countries. This Brazilian TDS involved essential steps to establish a TDS: **information about food consumption** (a recent national household food budget survey, including 5440 foods); **development of a Market Basket** (sampling of 57 foods consumed more than 2g/day/person, grouped in 24 food groups: cereals; leguminous; leafy, fruity and tuberous vegetables; tropical fruits; other fruits; flours; pasta; breads; biscuits; prime and standard grade beef; pork meat; sausage; poultry; milk/cream; other dairy products; sugars; sweets; sauces; alcoholic beverages; coffee and ready-made dishes); **kitchen preparation of foods** in restaurants of University of São Paulo (preparing ready-to-consume foods, individually and mixing foods of the same food group); **chemical analysis** (food groups were homogenized, pulverized and analyzed by Instrumental Neutron Activation). Trace element contents were determined in the 24 the food groups. Average trace element range concentrations were: Fe (mg kg⁻¹): 0.05 (alcoholic beverages) and 45.00 (biscuits); Zn (mg kg⁻¹): 0.02 (alcoholic beverages) and 88.62 (standard grade beef); Cr (µg kg⁻¹): 2.21 (coffee) and 734.99 (sweets); Se (µg kg⁻¹): 2.93 (coffee) and 128.98 (poultry). Additionally, individual daily trace element intake for each element was calculated by multiplying the individual trace element concentration in the sample by the weight of the analyzed food group. Individual average daily intakes ranges were: Fe (mg): 0.0008

(alcoholic beverages) and 1.89 (breads); Zn (mg): 0.0003 (alcoholic beverages) and 0.71 (cereals); Cr (μg): 0.033 (ready dishes) and 8.62 (breads); Se (μg): 0.067 (biscuits) and 1.52 (milk/cream). Total dietary intake of each trace element was calculated by adding daily intakes of the analyzed food groups: 4.9 mg/Fe; 3.7 mg/Zn; 19.8 μg /Cr; 7.5 μg /Se. According to the Dietary Reference Intakes (DRIs) for trace elements, the average daily intake was far below the Recommended Dietary Allowances for Fe, Zn, Se, and was also below the Adequate Intake for Cr for the most frequent population groups: women and men aged between 19 and 49 years. The adequacy percentage was: Fe 37.3, Zn 39.0, Cr 66.0, Se 13.5. Major food group sources of Zn, Fe and Se were consumed in low percentages. Wheat flour fortified with Fe in breads was the main source of Fe. Moreover, main food sources were not present in the Market Basket. The results as expected were below DRIs because the Market Basket contained only those foods most consumed, representing 57% of the weight of consumed foods by the population. Furthermore, the national food budget survey included meals only consumed in the household. Thus, results could be underestimated. Despite the number of foods, this TDS is well structured and likely to be increased to include more foodstuffs. This TDS from the state of São Paulo is the first of **this** kind in Brazil and can contribute to further research.