

ESTIMATED EXPANDED UNCERTAINTY OF MEASUREMENT FOR FISH SAMPLES ANALYZED BY INSTRUMENTAL NEUTRON ACTIVATION ANALYSIS

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Expanded measurement uncertainty is an estimate characterizing the range of values at which the true value of a measurand is at a defined confidence level. Expanded uncertainty is one of the three pillars of metrology, along with metrological traceability and methodological validation. Due to the importance of this parameter, it was estimated following the Guide to the Expression of Uncertainty in Measurement (GUM) for element measurement results obtained by Instrumental Neutron Activation Analysis (INAA) performed with short irradiations at the Pneumatic System of the IEA-R1 research reactor at IPEN – CNEN/SP. Samples of Brazilian sardine (*Sardinella brasiliensis*), one of the most consumed species in the city of São Paulo were analyzed and Br, Cl, Mg, Mn, Na and K were determined. For the analyzed elements, the values of expanded uncertainty with coverage factor $k = 2$ are lower than natural variation (standard deviation) of the elements mass fractions observed in a collected batch of 10 individual specimens.

NEUTRON ACTIVATION ANALYSIS CHARACTERIZATION PROCEDURES FOR FISH CONSUMED AT SÃO PAULO CITY

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The characterization of edible tissues of fishes consumed by humans is very important for determination of several toxic and potentially toxic elements, ensuring the food safety. The Instrumental Neutron Activation Analysis (INAA) comparative method allows the determination of several of these elements, as well as others, for example of nutritional character. This study is part of the International Atomic Energy Agency (IAEA) technical cooperation project of Latin America and Caribbean countries to ensure the quality of food and biomonitoring of contaminants in molluscs and fishes. Ten specimens of 5 of the most consumed fish in São Paulo city: whitemouth croaker (*Micropogonias Furnieri*), smooth weakfish (*Cynoscion learchus*), common snook (*Centropomus undecimalis*), Brazilian sardine (*Sardinella brasiliensis*) and bluefish (*Pomatomus Saltatrix*) were analyzed. Complete procedures for analysis, which includes purchase in the largest warehouse in Latin America, transport to the laboratory, storage, freeze-drying, milling, weighting and other preparations of the subsamples, and the short irradiation parameters for the determination of Br, Cl, K, Mn and Na are reported. Results obtained for macro and microelements are presented and are in agreement with analysis of oyster tissue and