

## PREPARATION OF AN IN-HOUSE BOVINE LIVER REFERENCE MATERIAL

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In nutritional studies, it is necessary to have certified reference materials with characteristic and concentrations similar to the matrix studied. Due to the high cost of these materials many laboratories cannot afford them to check their analytical performance. Therefore the preparation of an in-house material is of paramount importance. The purpose of the present work was to prepare an in-house bovine liver reference material to be used in nutritional studies. About 15 kg of the bovine liver sample was acquired from local market, and it was homogenized and freeze-dried in an industrial freeze-dryer. The sample was divided in small portions and put on the demineralized polyethylene bags and conserved in freeze-dryer before it was distributed to the laboratories. After that, the samples were distributed to some laboratories that utilized several analytical methodologies. The following analytical methods were used: Neutron Activation Analysis (NAA), Inductively Coupled Plasma Optical Emission Spectrometry (ICP OES), X-Ray Fluorescence Spectrometry (FRX), Atomic Absorption Spectrometry (AAS), Differential Pulse Voltammetry (DPV) and High Performance Liquid Chromatograph (HPLC). In the total, eighteen elements were determined. The content of the Br, Ca, Cd, Cl, Co, Cu, Fe, K, Mg, Mn, Mo, Na, P, Pb, Rb, S, Se and Zn elements were determined. In this collaborative study the participating

laboratories were requested to analyze not only this material but also two certified reference materials from NIST, Bovine Liver (SRM 1577b) and Typical Diet (SRM 1548a). The results obtained from participant laboratories were evaluated by the standard statistical treatment from IAEA procedures applying inter laboratory comparison exercise and proficiency test using target values<sup>1</sup>. The in-house bovine liver material showed good homogeneity characteristics for a great number of elements of interest for human nutrition. According to IAEA procedures almost all the results, obtained from different analytical techniques, could be accepted. There was good agreement for the results of 14 elements (Br, Cl, Cu, Fe, K, Mg, Mn, Mo, Na, P, Rb, S, Se and Zn). Statistical evaluation of the data revealed unsatisfactory results due to excessive dispersion for Ca (16 %), Cd (30 %), Co (25 %) and Pb (17 %).

### Reference

- [1] BLEISE, A., SMODIS, B. Quality control study NAT-6 for the determination of trace and minor elements in two moss samples. NAHRES-66, IAEA, Vienna, 2001.

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