

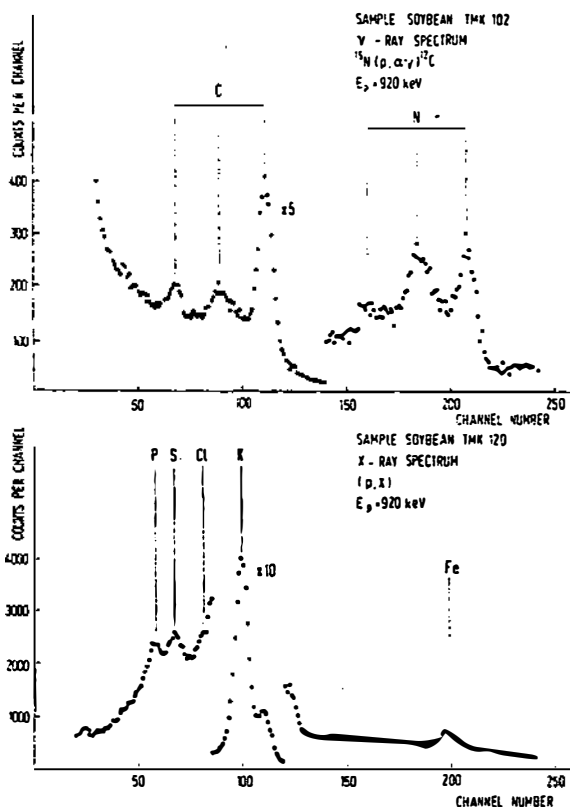
DETERMINATION OF PROTEIN QUALITY OF CEREALS AND GRAIN LEGUMES
BY PROTON INDUCED RADIATION

M. Budnar, P. Kump, P. Rupnik and I. Krefc

J. Stefan Institute and Biotechnical Faculty,
University of Ljubljana, Ljubljana, Yugoslavia

The use of proton induced X-ray emission (PIXE) and nuclear reaction $^{15}\text{N}(p, \alpha)^{12}\text{C}$ in the analysis of total sulphur relative to nitrogen content in samples of leguminous plants and cereals is presented. Recently a highly significant correlation between this ratio and a nutritive of cereals and grain legumes has been suggested (1). The measurements were performed on thick targets (100 mg/cm²) with a 2 MV Van de Graaff at resonance proton energy $E_p =$

920 keV. The gamma ray and X-ray spectra were measured simultaneously (Fig.). Deexcitation gamma rays (4.43 MeV) from the resonant nuclear reaction $^{15}\text{N}(p, \alpha)^{12}\text{C}$ were detected by a 10x10 cm NaI(Tl) detector. Characteristic sulphur X-rays (2.3 keV) were measured by an intrinsic Ge detector (resolution 170 eV at 5.9 keV). During the measurements of various samples the proton energy and geometry of the experiment were kept constant. The measured values of the total sulphur relative to nitrogen content are expressed in arbitrary non-dimensional units. Because



only comparison between various samples was concerned the approach proved to be quite satisfactory. The accuracy obtained so far is about 10 %.

Reference :

(1) Protein Advisory Group (PAG) Statement No.22, FAO, Rome, 1973