

STUDY OF ELEMENT COMPOSITION OF CEREALS AND FOOD IN VARIOUS CLIMATE ZONES OF UZBEKISTAN BY ACTIVATION ANALYSIS

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Methodical and metrological issues of the instrumental neutron-activation analysis of cereals (wheat, barley, corn, pea) taken from various soil-climate zones of Uzbekistan and the related food were studied experimentally. Comparing methods of drying in vacuum and annealing in air at $<450^{\circ}\text{C}$, the vacuum technique was found preferable for preparation biological samples. Procedures for determination of more than 30 chemical elements have been elaborated with detection limits within $(0.002\div 40.0)$ mg/kg. We also studied precision and accuracy (analysis of parallel probes and comparison of the results with the certificate data) of experimental determination of 30 chemical elements.

The elaborated technique was implemented for analysis of the element content of wheat, flour, bread and bakery, pea, barley etc. Comparative analysis of cultivated and wild wheat sorts has shown that an average element composition of wild sorts is much more enriched in microelements. As a whole, the element composition of wheat grains and other cereals depends significantly on the soil type and cultivation conditions and varies within a wide concentration range.

Content of iron and zinc in the cereals is very characteristic for monitoring of wild and cultivated forms of the cereals. Resolving this actual task will allow to carry out selection procedures for improving the related food quality. The report provides a comparative analysis of various kinds of agricultural products (wheat, sesame, rice, green bean etc) cultivated in various soil-climate zones of Uzbekistan. The behavior of iron and zinc in plants was examined more thoroughly. In particular, the correlation was found between the content of iron and zinc in the wheat flour with the coefficient of 0.87. An average content of iron and zinc came to 72.5 ± 18.7 and 29.3 ± 5.4 respectively. Analogous mutual relations between contents of other elements were discovered in plants and soils.