FROM THE EDITOR-IN-CHIEF

On the Analysis of Foodstuffs

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This field of the application of analytical chemistry is of course not new; chemical analysis of food has long been a traditional task. However, professional analysts in Russia have given it less attention, despite the existence of some centers that focus specifically on the study of the composition of foodstuffs, including the Research Institute of Nutrition of the Russian Academy of Medical Sciences, Moscow State University of Technology and Management, Voronezh Technological Academy, and other institutions.

Analytical tasks in this field involve the estimation of the nutritive value of products, in particular the determination of the amounts of the basic constituents, proteins, fats, carbohydrates, and vitamins. Tests for the amount of fat in milk, gluten in wheat, or sugar in white beet have been carried out rather widely. Another direction is the estimation of the safety of food due to the possible presence of hazardous trace components of natural or, most often, anthropogenic origin, residual pesticides, aflatoxins, heavy metals, etc. Many foodstuffs contain various additives, flavor enhancers, flavoring and coloring agents, etc., some of which can be hazardous.

Another direction of study is the detection of adulterations and counterfeits. This is quite often a difficult analytical problem. For example, to determine the origin of alcohol in vodka, an analyst must use chromatography-mass spectrometry and other expensive methods. When the scandal with the addition of cyanotriamide as a counterfeiter of protein [1] broke in China and the United States, it appeared that the reliable and relatively simple methods for determining

this compound are unknown (to the credit of analysts, these methods were promptly developed).

Chemical analysis is also used to assess changes in foodstuffs upon their storage, heating, etc. Today, the efforts of many analysts are directed to developing methods for determining antioxidants, e.g., flavonoids (melitin, etc.).

A separate problem that arose in the late end 20th century is the detection of foodstuffs obtained using genetically modified organisms (GMOs). These problems are discussed at special conferences and in special journal issues [2] and the need to solve them has stimulated the development of immunoassay methods, methods based on the polymerase chain reaction (PCR), etc. Devices that implement PCR have been created, including those based on microchips and functioning in the real-time mode.

In recent decades, foodstuffs are quite often tested for radioactivity in Russia, especially after the Chernobyl accident in 1986. Before that, the main sources of radioactive contamination were nuclear weapon tests carried out in the atmosphere in 1950–1960.

REFERENCES

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2. *Anal. Bioanal. Chem.*, 2010, vol. 396, p. 1949.

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