

IDENTIFICATION OF POTENTIAL HAZARDS OF UNINTENTIONALLY PRESENT CHEMICAL SUBSTANCES IN COFFEE **Speaker:** Leading Researcher, Scientific Secretary, Federal Budgetary Institution of Science "Federal Scientific Center for Medical and Preventive Health Risk Management Technologies of the Rospotrebnadzor",

Doctor of Medical Sciences P.Z. Shur

Doctor of Biological Sciences T.V. Nurislamova

Abstract

The Socialist Republic of Vietnam (SRV) and the Russian Federation are among the countries with high and recently increasing coffee consumption levels. Furthermore, coffee is one of the main export commodities of the SRV, including exports to Russia. This substantiates the selection of coffee for the identification and assessment of the potential hazards of chemical substances unintentionally present in coffee products.

Comprehensive studies of coffee products (green beans, beans of varying roast degrees, and the final beverage) indicate the potential formation of a wide spectrum of contaminants in coffee both during cultivation and thermal processing, predominantly during roasting.

The identification of undeclared and potentially hazardous unintentionally present chemical substances in coffee products, conducted on the basis of methodological approaches accepted in the Russian Federation (MR 1.2.0228-20), allowed for the detection of 36 substances (metals, volatile organic compounds, polycyclic aromatic hydrocarbons) using inductively coupled plasma mass spectrometry (ICP-MS), gas chromatography-mass spectrometry (GC-MS), and high-performance liquid chromatography (HPLC). Out of these, 10 were identified as possessing signs of potential health hazards. These include cadmium, tin, thallium, arsenic, aluminum, chromium, anthracene, pyrene, 2-methylpropanal, and 2-methylfuran. It should be noted that 2-methylfuran presents the highest exposure risk potential in this group. At the same time, a preliminary risk assessment showed that the intake of toxic metals via the coffee beverage does not create an unacceptable health burden (Hazard Quotient HQ < 1.0, carcinogenic risk CR<10⁻⁶), which allowed for their exclusion from the in-depth analysis of potential hazards.

However, for the brewed coffee directly consumed by the population, pyrene, 2-methylpropanal, and 2-methylfuran became the priority contaminants assigned to Category II. Among these, 2-methylfuran exhibits the highest exposure risk potential and was designated as the priority substance for the next stage of work, which involves quantitative exposure assessment and the justification of parameters for health risk assessment in the SRV and the Russian Federation.