

• CHEMICAL RISK FACTORS

Key questions and key findings

What is the trend in the contents of xenobiotics within the food chain?

- Comparison of the outcomes from the long-term monitoring suggests, especially in the case of heavy metals, a considerable improvement in the situation with the agricultural production in Slovakia. The most significant reduction is shown for cadmium. At present, most non-compliant samples result from the assessment of the mercury content.
- There is a gradual decrease in the contamination of game and fish; however, contamination still persists in industrial areas such as the region of Spiš and Gemer, Michalovce, and the area of Žiar nad Hronom. High average findings have been recorded for copper, lead, and mercury.
- In terms of the maximum permissible intakes by the human organism, none of the contaminants reached even half of the permissible limit.

Monitoring of xenobiotics in the food chain

Volumes of xenobiotic substances in foods are regulated by limits published in the Slovak Food Code and compatible with the EU limits.

Monitoring for xenobiotic substances within the food chain focuses on the food chain components such as soil and inputs into soil, drinking water, feeding and irrigation water, forage, feedstock and food of the plant and animal origin from domestic production as well as from import. It has been implemented through the Partial Monitoring System (PMS). Partial monitoring system called:

Xenobiotic in foods and forage is composed of **three subsystems**:

- Coordinated focus-specific monitoring (CFM) has been used since 1991
- Consumption pool monitoring (CPM) has been used since 1993
- Monitoring of game, wildlife, and fishes (MGF) has been implemented since 1995

Partial monitoring system has been connected to the GEMS/FOOD EURO international monitoring system since 1994.

◆ Coordinated focus-specific monitoring (CFM)

Coordinated focus-specific monitoring (CFM) has the objective to determine actual mutual relationship between the degree of contamination of agricultural land, irrigation water, feeding water, crop and animal production, within the primary agricultural production, and obtain information on the contamination of individual food chain components.

53 081 samples were extracted over the entire monitored period (22 years), containing **3 042** limit-exceeding samples, which represents **5.7%**. **In 2012, 395 samples** analysed for the content of chemical substances, nitrates and nitrites were extracted from 202 hunts and 37 agricultural enterprises. Monitoring was carried out for 30 agricultural subjects, analyzing soil samples from 9 485

ha, including the crop produced from this soil. Samples with limit-exceeding values in 2012 have been detected in feeding water, especially for nitrates (2 samples). In other commodities, no limit-exceeding samples were found in 2012 (soil, forage, feedstock).

◆ Consumption pool monitoring (CPM)

Objective of the **Consumption pool monitoring (CPM)** is to obtain data on contamination of foods within the consumer network and subsequently assess exposition of the population to the monitored contaminants. Samples are purchased from the commercial network twice a year (May, September) at 9 Slovak sites.

Exposition of the public to xenobiotic substances is compared with permissible tolerable weekly intake for arsenic, cadmium, mercury, lead, tolerable daily intake for nickel, recommended daily dose for chromium, and acceptable daily intake for nitrates, PCBs, and pesticides. In each consumption basket there are analyses conducted for chemical elements, nitrates, nitrites, polyaromatic hydrocarbons, PCBs, selected pesticides residuals, residuals from veterinary medications, from microtoxins, as well as selected additives. Radioactive contamination was monitored for the samples of milk and drinking water.

Over the period of **twenty years, 12 947 samples** were analysed, including **517 samples**, i.e. **4.0%** that exceeded permitted limit values, especially in nitrates and chemical elements.

21 basic food items and drinking water (abstracted since 2007) are sampled for the consumption basket. 256 samples were analysed in 2012. Of these, 1 sample (dioxines) extracted from beef did not comply with the set limits (chain of stores in Moldava nad Bodvou).

◆ Monitoring of game, wildlife, and fishes

Monitoring of game, wildlife and fishes has been carried out since 1995 with the goal to gather information on the impact of the environmental contamination on the selected species of game and fish. (from free water formations) Since 1995, in total, there have been analysed **4 001 samples** of fish, game, mushrooms, forest products, as well as feeding water and sediments from water formations. The set limits were exceeded by **18.9%**; in the case of fish the findings were mainly negative due to increased contents of PCB, dioxins, mercury, and cadmium. Higher values for cadmium and mercury have been shown also for game and mushrooms. **In 2012**, there were **134 samples** abstracted, of which **8.96%** exceeded the limit, just like in the previous time period, exceeded were the limits for PCB in fish from 7 regions of Slovakia (Třebišov, Košice, Michalovce, Prievidza, Banská Bystrica, Martin and Prešov).