ANALYSIS OF TOXIC METALS IN DAIRY PRODUCTS USING THE VOLTAMMETRY METHOD

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Introduction. Dairy products are widely consumed by humans and represent an important source of proteins, fats, and minerals for the body. Unfortunately, due to environmental pollution, these products may also contain toxic metals along with other harmful substances. The accumulation of toxic metals in dairy products at elevated levels poses a serious threat to food safety and human health. Therefore, determining the amount of toxic metals in dairy products is of great importance. In this study, the contents of toxic metals such as lead (Pb) and cadmium (Cd) in certain dairy products were determined using voltammetry, and the results were compared with the permissible hygienic limits.

Objective of the study. To determine the concentration of toxic metals in biokefir, kefir, yogurt, curd (suzma), and sour milk (qatiq) samples using a rapid, convenient, and cost-effective voltammetric method.

Materials and Methods. The study was conducted on biokefir, kefir, yogurt, curd (suzma), and sour milk (qatiq). A 4 g portion of each sample was weighed on an analytical balance. To remove organic matter, the samples were first heated in an open flame. The resulting black residue was then calcined in a muffle furnace for 10 hours to obtain white ash. To the ash, 2.5 ml of a background solution and 0.4 ml of 0.4% HCl solution were added, mixed, and filtered into a 25 ml volumetric flask. Distilled water was added up to the mark. The prepared solution was analyzed using the **"Volta 1.1" voltammetric analyzer**, and the concentrations of toxic metals were determined by the voltammetry method.

Results and Discussion. The voltammetry method demonstrated high sensitivity and allowed the detection of trace amounts of toxic metals in dairy products. The concentrations of cadmium and lead determined in the samples are presented in the table below.

Toxicmetal	Curd (suzma) (mg/kg)	Kefir (mg/kg)	Yogurt (mg/kg)	Sour milk (qatiq) (mg/kg)	Biokefir (mg/kg)
Pb	0.230	0.090	0.052	0.015	0.010
Cd	0.0829	0.0001	0.047	Notdetected	0.002

According to the data, both Pb and Cd showed the highest concentrations in curd (suzma). The lowest concentration of Pb was found in biokefir, while the lowest Cd concentration was observed in kefir. Cadmium was not detected in sour milk (qatiq).

Conclusion. The obtained results confirm the presence of toxic metals in certain dairy products, indicating the necessity of their continuous monitoring. Moreover, voltammetry has proven to be an effective and reliable method for determining toxic metals in dairy products. The detection of toxic metals in biokefir, kefir, yogurt, curd, and sour milk highlights the importance of strengthening food safety monitoring and enforcing stricter sanitary regulations.