SUMMARY

The scope of the work included the application of methodological assumptions in the prevention of ensuring the health safety of water. The main objective of the work was the verification and validation of the method of nitrite determination in the research process in accordance with the implemented quality system and the application of methodological assumptions in the prevention of ensuring the health safety of water. In accordance with the guidelines of the Decree of the Minister of Health of December 7, 2017 on the quality of water intended for human consumption [Journal of Laws 2017 item 2294], physical, chemical and microbiological analysis of water intended for consumption was carried out from selected drinking water collection points. Physical parameters such as turbidity, color, pH, specific electrical conductivity and water temperature at intake were determined. Chemical parameters examined included chloride concentration, manganate index (VII) (oxidizability with KMnO4), total calcium and magnesium (hardness), nitrate, nitrite, ammonia nitrogen NH4+, total iron and manganese, among others. Analysis was also carried out for microbiological parameters. The total bacterial count at 22ºC, coliform and Escherichia coli counts, and fecal enterococci were determined.

Confirmed test methods and their suitability in the test unit have given confidence that the method is reliable and the results are reproducible. Errors caused by improper test execution, accidental errors, or permanent errors were eliminated through the implemented test quality system and confirmation of the validity of the results. The validity of test results has been confirmed through participation in proficiency tests. The calculated uncertainty guarantees that the test result is within the range with 95% probability.

During the 4-year monitoring period, the quality of drinking water collected from the municipal water supply system in Kalisz from 2020 to 2023 was verified. 64 water samples were collected, of which 52 samples were determined group A parameters (turbidity, color, pH, conductivity and microbiological parameters total bacterial count, coliform group and Escherichia coli) and 12 review monitoring samples. During the four-year study, no exceedances of microbiological parameters that disqualify water as water for human consumption were observed. The gr coli and Escherichia coli bacteria and fecal enerococci parameters indicative of environmental or fecal contamination were not detected. Basic

physical tests also showed no exceedances of these parameters (color, turbidity, pH, conductivity). The hardness of the water, i.e. the sum of calcium and magnesium, ranged from 265 mg/l to 392 mg/l, indicating a constant water composition. The water tested was moderately hard. The salinity of the water, i.e. the chloride content, ranged from 38.0 mg/l to 49.8 mg/l. The content of nitrogen compounds - nitrates, dangerous for the human body was well below the permissible value (50 mg/l) and ranged from 1.5 mg/l to 2.5 mg/l. Pollution due to the presence of nitrite and ammonium ion was not present. Iron and manganese were detected in amounts of 40-124 µg/l and 13-44 µg/l, respectively. The permissible values of these parameters were not exceeded at any of the tested points. The testing procedures carried out showed good water quality in the taps of Kalisz residents supplied from wells located on Warszawska and Szeroka Streets of the municipal water supply system.