



VARIATION ANALYSIS OF HEAVY METAL RESIDUES IN MILK AND THEIR INCIDENCE IN MILK PRODUCTS FROM MOLDAVIA, ROMANIA

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Abstract

The study was conducted to evaluate the concentration variation of heavy metals in milk collected from two different groups of sources: milk collecting centers and dairy farms. Also, their incidence in milk products, as pasteurized milk, butter milk, yogurt, cream, cheese, hard cheese was determined in the NE Romania (Moldavia).

The analytical results revealed that the milk samples from the collecting centers had higher levels than the samples from the dairy farms of Pb (2.90 to 3.45 vs. 1.88 to 2.64 $\mu\text{g}/\text{kg}$) and Ni residues (11.31 to 11.88 vs. 11.17 to 11.91 $\mu\text{g}/\text{kg}$) and lower levels of Cu (224.05 to 293.15 vs. 250.15 to 313.70 $\mu\text{g}/\text{kg}$) and Zn (2036.11 to 2517.86 vs. 2066.32 to 2739.43 $\mu\text{g}/\text{kg}$). In the milk products, the average concentration of Pb varied from 2.73 $\mu\text{g}/\text{kg}$ in pasteurized milk to 4.05 $\mu\text{g}/\text{kg}$ in hard cheese; the average concentration of Ni varied from 12.03 $\mu\text{g}/\text{kg}$ in pasteurized milk to 16.33 $\mu\text{g}/\text{kg}$ in hard cheese; the average concentration of Cu varied from 256.51 $\mu\text{g}/\text{kg}$ in pasteurized milk to 1289.85 $\mu\text{g}/\text{kg}$ in hard cheese; the average concentration of Zn varied from 2374.18 $\mu\text{g}/\text{kg}$ in pasteurized milk to 12146.43 $\mu\text{g}/\text{kg}$ in hard cheese. Pb and Ni were found at concentration levels less than WHO tolerated values depending on the amount eaten or drunk (25 $\mu\text{g}/\text{kg}/\text{week}$ and 5 $\mu\text{g}/\text{kg}/\text{day}$ respectively). The most average concentration levels of Cu and Zn could provide the daily human consumption requirements of 1-2 mg and 3-15 mg, respectively.

Key words: heavy metal residues, milk and milk products, T-test

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