

Vol. 12 (3): 159-164 (2022)

## ESTIMATION OF HEAVY METALS ACCUMULATION BY VEGETABLES IN AGROECOSYSTEMS AS ONE OF THE MAIN ASPECTS IN FOOD SECURITY

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Received March 2022; Accepted April 2022; Published May 2022;

DOI: <https://doi.org/10.31407/ijeess12.320>

### ABSTRACT

The article is devoted to the study of the intensity accumulation of heavy metals (Pb, Cd, Zn, Cu) by vegetables in agricultural lands. Vegetable products play important role in human nutrition and requirements for quality and safety are very strict. The study was conducted on dark gray podzolic soils in the Tyvriv district of the Vinnytsia region. The fruits of the cucumber variety Dzherelo, the zucchini variety Chaklun, and the pea variety Geneva were used for the research. It is noted that the main indicators of climatic conditions during the study period were favorable for growing vegetables. It was determined that among vegetables (food peas, zucchini, cucumber) the highest content of heavy metals was observed in pea fruits. At the same time, it was found that the Cd content in pea fruits exceeded the PL (permissible level) by 1.61 times at a concentration of heavy metals in the soil below the TVL. Among heavy metals (Pb, Cd) higher migration and translocation were observed in the studied vegetables according to Cd, and among heavy metals-trace elements (Zn and Cu) - according to Cu. It was found that pea fruits were characterized by the highest coefficient of accumulation of heavy metals (Pb, Cd, Zn, Cu). The risk factor for heavy metals in the studied vegetables was lower than the threshold level of 0.1, except for Cd in peas, where this figure was 1.61 times higher.

**Keywords:** heavy metals, Pb, Cd, Zn, Cu, soil, pea, zucchini, cucumber, accumulation, agroecosystem, security.