

MODELLING THE INFLUENCE OF THE ENVIRONMENTAL FACTOR ON ENSURING THE SUSTAINABILITY OF UKRAINE'S FOOD SECURITY

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Abstract

The theoretical and methodological research presented in the present paper is based on the development of a model of the impact of environmental factors ensuring the sustainability of food security in the context of dynamic acceleration of globalization processes. This method allows to synthesize the function of analyzing the level of protection of the economic security system, and it can be used to provide recommendations for effective management decisions to prevent the impact of environmental factors. The aim of the research is to improve the method of managing the impact of environmental factors on food sustainability, which differs from existing ones taking into account the delay of the food security system to the degree of intensity of the impact of a particular factor.

The research was conducted on the materials of the State Statistics Service of Ukraine and data of the Ministry of Health about the status and dynamics of food consumption adequacy for one person. The methodical basis of the research were general and special methods, namely: system analysis - in order to comprehensively characterize the strategic potential of agricultural development; standard deviation, synthesis and comparison - in diagnosing the potential of the agricultural sector to ensure the sustainability of national food security, the method of analysis of dynamic processes using linear differential systems with constant delay - to develop a model of environmental impact on food security of Ukraine.

Based on the developed model of the influence of environmental factors on ensuring the sustainability of food security, new ways to improve existing mathematical models for their practical application in ensuring the sustainability of national food security were identified. By means of a mathematical model of delayed oscillations and mathematical control theory, an algorithm has been developed to identify the level of protection of national food security sustainability in order to effectively manage dynamic processes of environmental impact management, depending on its duration and intensity.

For the first time, the functional dependencies recommended for use have been adapted to the conditions of effective functioning of the food security system. Delay factors related to delays are taken into account. As a result of the research, analytical dependences of the intensity of the influence of environmental factors on ensuring

the sustainability of food, time-based safety systems of differential equations with initial conditions that take into account the behavior of the system over time. The proposed dependences allow to develop the patterns of distribution of losses probability due to the impact of environmental factors on the system of national food security.

Key words: *Food security, Agriculture, Environmental factor, Management of dynamic processes, Dynamics of intensity of influence, Sustainability of food security.*