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## IMPROVING THE QUALITY OF MANAGEMENT IN THE SYSTEM OF FORECASTING MILK PROCUREMENT IN COMMUNITIES USAGE THE TECHNOLOGY OF NEUTRON NETWORKS

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## Abstract

The issue of purchasing the required amount of milk is a strategically important condition for ensuring the effective planning of the economic activities of agricultural enterprises. According to scientific works and subject area analysis, the process of forecasting the volume of raw milk procurement in the communities is expedient. The main aim of the study is to build the model of forecasting the volume of raw milk procurement in communities using the artificial neural networks.

The theory and methods of artificial neural networks, mathematical statistics, analysis and synthesis, induction and deduction, correlation-regression analysis of modeling results and errors were used in this work. Based on the prepared initial data (volumes of milk production on the territory of the Yasenivka community of the Lviv region), an artificial neural network training has been completed, which provided a model that can predict the daily volume of milk production in the community based on input data in the Neural Network Wizard.

We proposed to use a three-layer perceptron. There are 370 input neurons (number of input variables) in the input layer of the network, 7 neurons in the hidden layer, which are determined experimentally by creating a network, 365 neurons in the output (corresponds to a calendar year or the number of days of forecasting raw milk). The input variables are the daily volumes of raw milk procurement for the previous days from the separate communities, as well as climatic conditions in the retrospective period. The output variables are the predicted indicators of daily volumes of raw milk (for a particular day during the calendar year for a given community). While forecasting the volume of raw milk procurement in the communities, we have taken into account the relationships that determine the forecasted value of the daily volume of raw milk procurement, which depends on: the volume of raw milk procurement of the corresponding day of the previous period (calendar year); climatic conditions



(average monthly air temperatures, precipitation, etc.); seasons (for example, the method of keeping cows during production, etc.). Based on the performed research of the adjusted artificial neural network, there was established the tendency of change of daily volumes of milk production on the territory of the community (real and predicted) for the conditions of the Yasenivka community of the Lviv region.

Thus, it is proposed to forecast the procurement volume of milk in settlements using the tools of artificial neural networks. From the presented tendencies of change of daily volumes of raw milk procurement on the territory of Yasenivka community (real and forecasted values) it is seen that the use of artificial neural networks gives a fairly accurate forecast and this is the basis for making quality management decisions to plan relevant logistics.

Key words: Artificial Neural Networks, Community, Forecasting, Procurement, Raw Milk.