

INTELLIGENT SYSTEM TECHNOLOGICAL FOR MONITORING OF FOOD PROCESSING INDUSTRIES

Vasilij Kishenko¹

¹*National University of Food Technologies, 68, Volodymyrska str., Kyiv, Ukraine
kvd1948@gmail.com*

In terms of control problems food production are related to complicated organizational and technical systems. One of the characteristics of such objects control is considerable uncertainty in the evaluation technological parameters such as quality indicators of raw materials, semi-finished and finished products. Detection of situational behavior of technological processes through significant signal interference and noise of random nature is also an important problem. The presence of complex nonlinear dynamic interconnections in objects of food industry generates phenomena of intermittency as alternating chaotic (turbulent) regimes with regular (laminar) with the formation of dissipative spatial and temporal structures. An important factor is the analysis of critical and resources conflicts, detection of reasons of their origin and solutions. These factors complicate the problem of technological forecasting, analysis of work situations, resource allocation in the production of foodstuffs, making operational economical solutions for control stimulating non-coercive nature.

Solution of these problems is provided by comprehensive observation of the control object, analysis of technology information, forecasting the development of technological processes of different depth, including trends and forecasting of system modifications due to intellectual information-measuring systems of technological monitoring. System of technological monitoring was developed for food enterprises based on modern information technologies. The main applied functions of this system are: the analysis of input technological information, which includes problem of rejection abnormal results of measurements of different nature using neural networks; filtration of the measured data using wavelet transformation; recovery gaps in the data based on precedent and fractal analysis; classification of technological regimes and production situations by methods of pattern analysis and Kohonen's maps; technological forecasting powered by DATA MINING and flicker-noise spectroscopy; constructing mathematical models of optimal control of technological processes due to original methods of structural and parametric identification and fuzzy approximation, conflicts analysis and technological nature of recommendations on their solution.

The system is integrated into automated systems of technological processes due to information and computer networks. As the production tests show, the developed technological monitoring system provides improvement of product quality, increases productivity manufacturing equipment and contributes to resource conservation.

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