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MANAGEMENT MODEL TO JUSTIFY THE CONDITIONS OF GRINDING GRAIN CRACKERS OPTIMIZATION

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I. Statement of the problem

Crushing crackers in enterprises primarily intended for processing defective bread wheat varieties, the term of which has ended, and for the production of bread crumbs.

II. Purpose

One of the ways to improve the grinding process is the search of the optimal conditions of the process. Therefore, the planning and control of the experiment involves active intervention in the process and gives an opportunity to choose the level of influential factors. The optimization parameters must be effective in achieving the objectives of the study, a universal quantitative, statistically defined; have a physical meaning, simple and easy to determine [1].

III. Analysis of the results

Investigated the grinding process gives the opportunity to consider the role and the influence of the equipment design features. The process includes grinding the input control parameter *X,*; exciting options *F;* output managed settings *Y;* estimated parameters *Z.* A set of input and output factors influencing the process in the working chamber of the crusher, is illustrated in flowchart (fig.1).

It was composed a hierarchical structure of the grinding process, which includes factors affecting the quality of the grinding and which can be measured and presented in numerical form. Selfadjoint structure of the technological process allows you to select the main factors for the optimization of grinding.

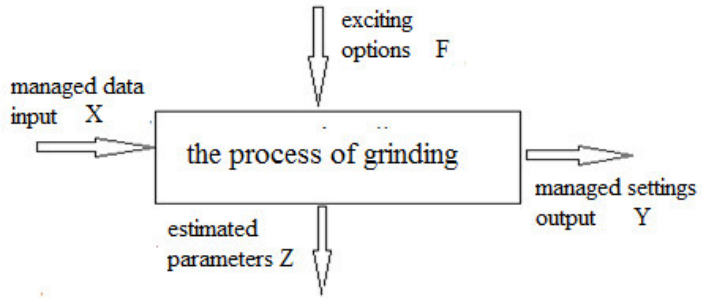

Fig. 1. Controllability scheme grinding of dried bread

Among the controllable factors that change, adopted the following:

X_1 – the temperature of the dried pieces of bread, K°;

X_2 – the speed of rotation of the drive shaft, kHz;

X_3 – the diameter of the sieve holes, mm;

X_4 – grade milled hammer.

For the grinding process is also affected by a number of factors that have stochastic character (F) and which depend on the specific conditions of the process (Z). The handling of the grinding process is characterized by the ability to transfer the controlled system in a given state through specific management actions u(t), providing the translation system from an arbitrary initial state x_0 in a certain state $x_д$ within a certain time.

For the optimization parameters characterizing the energy efficiency of the process and the quality

breadcrumbs taken:

Y_1 – specific energy consumption per cycle of grinding, kW;
Y_2 – the temperature of obtained crackers, K°;
Y_3 – viscosity, Pa·s;
Y_4 – the water retention capacity of crackers, %;
Y_5 – the dispersion of crackers, mm;
Y_6 – adhesion to the working bodies, Pa.

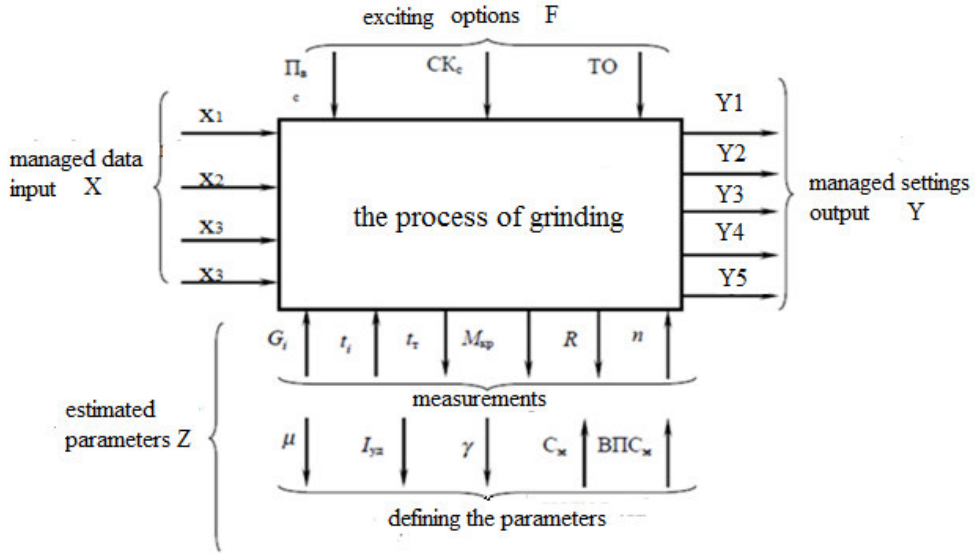

Fig. 2. Flowchart of crushing crackers

Parametric diagram (fig.2) allows to establish the relationship between variables that quantitatively characterize the mathematical model of the process [2].

Controllable factors determine the efficiency criterion, the result of the process, the purpose of the meeting. Among them are the quantitative parameters - performance, output quality products and comprehensive quality indicator, humidity, specific volume, viscosity and others [3, 4]. As parameters to optimize the process adopted physical, structural and mechanical indicators of product quality and the cost of electricity for the process.

Conclusion

There was developed the plan of the experiment for the optimization of the grinding process of crackers. The extreme results of the experiment allow us to determine the optimal conditions under which the grinding process will provide the best output parameters.

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