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Influence of loading of specific flour sieves for sifting and extraction on extracting total other fragments to SC Spicul SA Iasi

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Abstract

The sensitivity of the technological process of modification of grist is very high moisture grain. Thus, the changing humidity ± 0.1%, extraction of flour changes with ± 0.8%, flour of top quality with 0,5% and the second quality with ±1%.Influence of modification and vitrescence of the standard mass within a Grist practically does not occur in the pithy Grist. Grain flow variation influences proportionally on changes in the mining of products and to a lesser extent on the quality indices, because it changes loading specified in technological equipment. Changing the composition of the different granulometrice intermediates leads to variation of flow of product, depending on the amount of screening and denial.

Keywords: mining, optimization, efficient

1. Introduction

In the factory Grist runs a complex operation to separate the parties cover parts of the endosperm and shred them up to the dimensions of the particles of flour. These operations are performed in several steps, depending on the purpose of Grist.The input values are provided for Grist: grain quality indexes of (type, range, standard, mass flow rate, humidity). Output values are: extraction and the meal quality grades.Probability of factors are conditioned by the properties of the products, peculiarities of technological facilities.

The influence of commodity is explained by its nature as a powdery material, which is manifested by non-uniform distribution of the product in its division, depending on the moisture content and physical mechanics parameters. Influence of loading specific q on extracting total extraction and other fragments is essential, it is expressed by increasing extraction with 0.1% every kg/cmxh, specific loading sieves and derives no changes in the quality of flour and related products.

Specific control loading is done to ensure the continuity of the process of grinding in grist production [1-4].

2. Material and methods

The influence of the leadership of Grist refers to: change the distance between roles, and kinematics parameters of flat sieves, the degree of openness of various valves recirculating. Thus, changing the flow of grain, intermediates and even various fractions of flour.Stock management for sifting and action is used to modify the frequency of rotation of the driving shaft flat sieves, sorting to the stages of intermediate products and control of the meal.

The sifting process efficiency is influenced by flat sieves and sieve which is evaluated according to the coefficient of extraction. It depends on a number of factors: load per unit of surface mesh, particle size composition, moisture content of the mixture, the ratio scale with the frames of the site, the kinematics parameters, the cleanup of the sieves.

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The influence of layer thickness on the effectiveness of flour sifting is characterised by a non-linear dependence of maximum presence. The variaty of the humidity of grain processing is a redistribution of factions on the woven flat. They are imposed on upper fragments rejections, where every tenth of a percentage point of moisture causes modification of extraction with 0.81%. This is explained by the higher humidity of grains, capsule entering basic, intermediates obtained as denied the sieves.

The dependence of the efficiency of loading specified sifting η, q can be described by the equation, $\eta = Axe^{-a}q$, where: A-coefficient that depends on the size of the screen splits and grain size composition of the mixture originally, the amount of time that characterise the product stays on sieve, q- loading on the surface of the screen, kg/sq mxmin. Separation of lawnmowers meal takes place in two stages: initially in the first stage the product is divided into two factions after the granulosity , in the second stage processing takes place in parallel, the particles pass through small and large particles form the refusal of the sieve, while particles with a velocity less than afloat (particles and small particles wrapper endosperm) are removed from the equipment by the airflow. Efficiency of machine work shall be determined after extraction meal products, and minerals content. On the effectiveness of the machinery of meal influence: the kinematics parameters of the sieve, speed of flow air, loading, the composition of the mixture and humidity.

3. Results and discussions

Moisture content determine their machines of the factions, as follows: the higher the moisture content is greater than and less grain, with both the specific load sieve to grinding will be higher.

The numbered passages with 1, loading specified is greater than 2 numbered passages. Which means a more efficient separation in second gear.

Increase the humidity increases the specific loading and extraction.

It appears that the mineral content of the flour is low compared to the mineral content recorded at fractions I, II and III

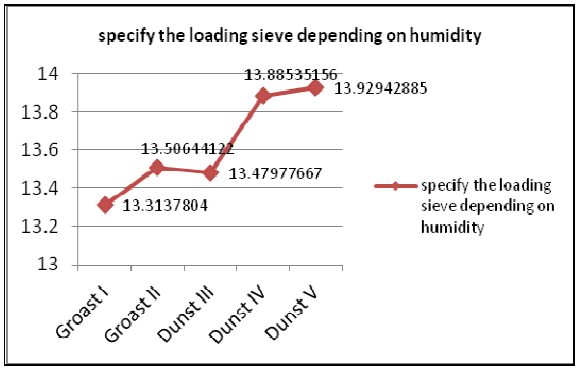

Figure 1. Dependent on factions based on moisture content

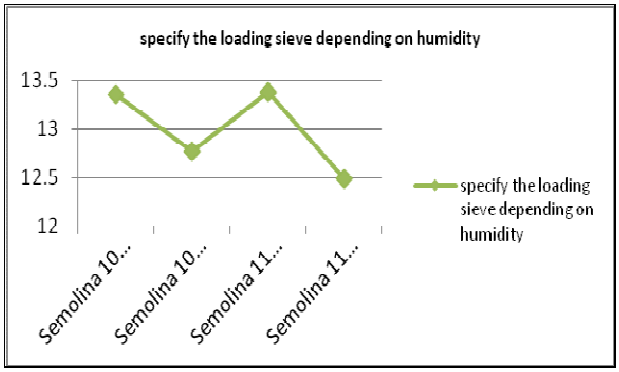

Figure 2. The specify the loading sieve depending on humidity

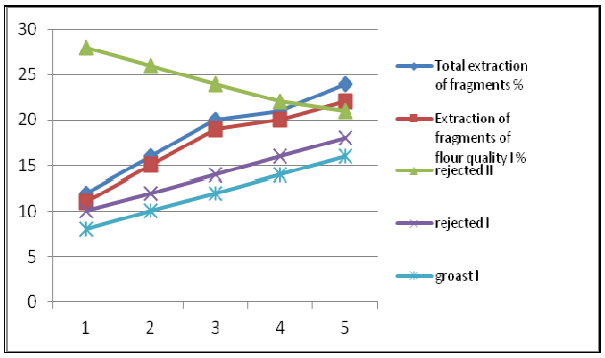

Figure 3. Dependency extraction curves of total extraction fractions from flour to semolina I and semolina II

It is to be noticed that the amplitude of minerals (variation) is higher when the shredding the grain is around the interval of 60-80%. These aspects indicate a linear correlation with lack of intensity between the series of experimental data (minerals contents – degree of fractions). In this direction, the cubic function was used, $y = b_0 + b_1 x + b_2 x^2 + b_3 x^3$, which, for the field of studied definition, follows closely the studied phenomenon.

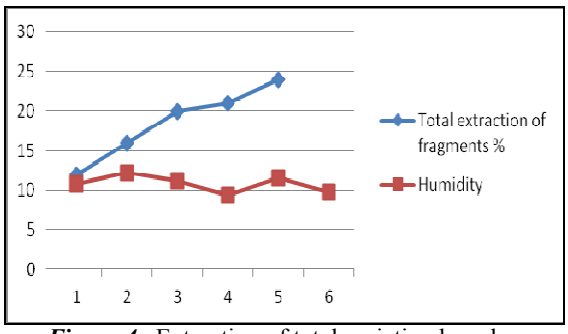

Figure 4. Extraction of total variation based on moisture content

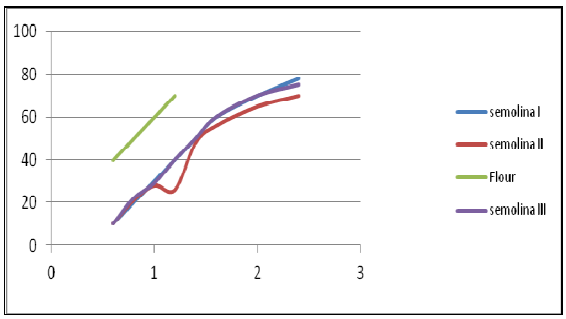

Figure 5. The degree of mining of factions based on the contents of the minerals

Table. 1. Coefficients of regressive cubic function $y = b_0 + b_1 x + b_2 x^2 + b_3 x^3$ (minerals contents – degree of fractions)

	r2	Sig f	b0	b1	b2	b3
selmolina	1	0.011	3.30	0.25	-0.0016	$\|b_3\| < 10^{-4}$
Semolina1	0.998	0.045	8.38	0.55	-0.0022	$\|b_3\| < 10^{-4}$
Semolina 2	0.999	0.035	3.61	0.05	-0.0002	$\|b_3\| < 10^{-4}$
Semolina 3	0.985	0.122	3.41	0.30	-0.0024	$\|b_3\| < 10^{-4}$
Flour	0.999	0.032	6.21	1.03	-0065	$\|b_3\| < 10^{-4}$

4. Conclusions

1. The entire process of grinding must be driven by finding the optimal variant of the fragments and ditribution on load, with highlighting passages technological kinematics and geometrical parameters of the working bodies, by optimising statistics, taking into account the amount of semolina obtained at shredding the grain and the quality of their time on the content of the minerals.
2. You can appreciate the process efficiency and by quantity and quality of the work system rejected the influence of the first three passages of shredding the grain, you can assess the quantity and quality of semolina and dunst and quantity and quality of the flour produced.
3. The values of the correlation coefficients (minerals contents – degree of fractions) for each fragments are situated around the superior value, thus indication a superior correlation between the two series, so the increasing of the minerals at which the shredding is made implies a variation of losses following the model described above and the values of the studied indicators are higher.

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