Powered rationale of technological process razbyvky kormovoy beet fields in zahonky at s mehanyzyrovannoy Other cleaning and funds for ego implementation.

Kormovaya beet, TECHNOLOGY Other cleaning, razbyvka field kornenapravytel.

Present rationale tehnolohycheskoho process razbyvky kormovoy beet fields on zahonky in mehanyzyrovannoy's growing equipment and funds for ego implementation.

Feed beet, technology of cleaning up, lying out of the field, guider of root crops.

UDC 631,363

ANALYSIS OF INFLUENCE OF BASIC PARAMETERS ODNOVALTSOVOYI crusher ON INDICES OF FOOD GRINDING

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Havedeni experimental results influence the basic parameters odnovaltsovoyi crusher for crushing parameters of quality products.

Grain feed odnovaltsova Zernodrobilka module grinding, coefficient of variation.

Problem. Ensuring the country sufficient livestock production is not possible without security industry quality feed. It is extremely important in feeding all kinds of farm animals and poultry are grain feed. As part of the mixed feed or combined feed grain cereals can range from 30-40% to 60-70% [1].

Before feeding grain to animals, as well as all types of feed raw materials, should pass certain preparatory operations, including the most common, and we can say is mandatory grinding operation [2, 3].

By grinding grain quality forage distinguish the following requirements [3]:

1) the average particle size of the feed must meet scientifically sound zootechnical requirements; in particular, provides three degrees of grinding: small (average particle size - 0,21.0 mm), Medium (1,0-1,8) and large (1,8-2.6 mm).

2) The coefficient of variation of the fractional composition of grinding products should not exceed 45-65%. The upper limit

recommended for small and medium grinding grain to coarse grind lower. Reducing the coefficient of variation of the fractional composition during the grinding of feed for every 10% equivalent to the technological efficiency savings or additional 1-3% forage production.

Analysis of recent research. Agricultural production and feed industry for the processing of feed materials are widely used hammer crushers [4, 5]. Compared to most other fodder processing machines, they are simple in design, service, broad versatility. However, these machines have significant drawbacks, primarily - High power process (12-20 kWh / t) and large grain size uneven grinding products, which eventually leads to overspending grain.

Rolling mills provide high quality grinding, particularly cereal forages at uniform granulometric composition and output of small dust fraction. In practice kormopryhotuvannya dominated crusher with an even number of rollers, with a capacity of at least 1.5-3 t / h. Meanwhile, small livestock enterprises are rational standard size shredder feed grain productivity of 350-400 kg / h [6], and in some cases less. In this case simple a structural plan and more appropriate for the operating costs will valtsedekovyy option (odnovaltsovyy).

The purpose of research. To prove rational parameters valtsedekovoho Cutter grain that can get you grinding products according zootechnical appropriate quality requirements.

Results. To implement the program of experimental research was developed structural and functional scheme under which the installation is made for grinding grain feed (Fig. 1).

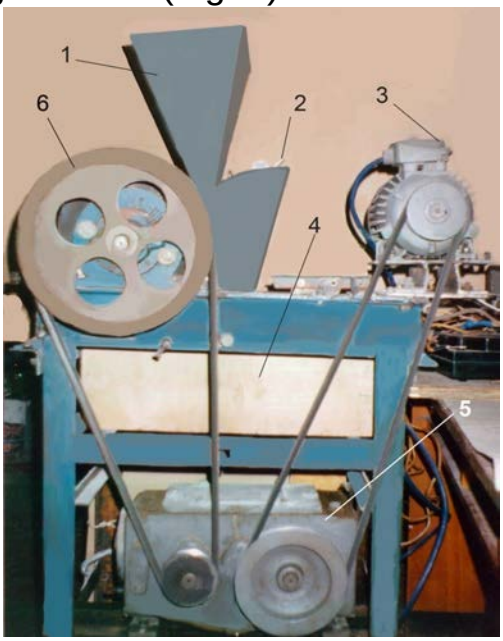

Fig. 1. Scheme of the experimental setup: 1 - Grain 2 - guide 3 - electric, 4 - a box for the finished product, 5 - CVT 6 - drive pulley.

The experimental setup includes (see. Fig. 1): storage tank with regulating valve, the working chamber of the guide rail, roller-deck and inside neck and unloading. The surface of the roller, checkered, deck - smooth.

To change the way grain processing variables used deck (Fig. 2) with different angles girth *γ*.

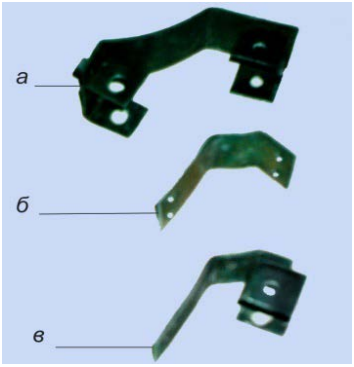

Fig. 2. Types studied Dec: A - deck (*γ*= 45 °), b - deck (*γ*= 25 °), in - deck (*γ*= 10 °).

The experimental setup allowed:

- Adjust the rotational speed variator rollers using;
- Change the angle of the guide;
- Set one of three decks with the corresponding angle circumference;
- Change the size of the working gap between Waltz and deck.

During experimental studies determined the quality of the process of grinding grain material and energy parameters evaluated grinding process.

To assess the quality of grinding feed in experiments determined depending grinding module M, (the average size of crushed particles mm) and coefficient of variation of fractional composition *v* (Degree of irregularity,%) process of grinding coarse grains such basic parameters of the crusher:

n - rotational roller, min-1;

β - The angle of the guide;

γ - Angle coverage of roller deck;

δ - The value of working gap, mm;

Evaluation of quality feed grinding was carried out on the basis of screening sample (weighing 100 g) On reshitnomu classifier. Samples were weighed on laboratory scales VLR-200 g, The error which is $\pm$0.5 mg.

For the experiment were chosen orthogonal plan rototabelnyy 24 [7]. In order to eliminate the influence of systematic errors caused by fluctuation characteristics of the material held randomization, the essence of which is to select a sequence of tests for random number

table.

After processing experimental data on a PC using the application Statistica 6.0 were obtained regression equation.

In order to test the hypothesis on the adequacy of second-order models were conducted statistical analysis of these equations. Adequacy test patterns and significance of regression coefficients performed using Applied statistical program Statistica 6.0.

Statistical analysis allowed us to determine significant regression coefficients, and get a simplified equation that adequately describe the process with a certain probability of 95%.

Mathematical models after determining significant regression coefficients and conducted decoding acquired the following:

for barley

$$M = 1.136895 - 0.00093n + 0.01218\beta + 0.006133\gamma + 0.216309\delta - 0.000008n\beta - 0.000011n\gamma - 0.000331n\delta - 0.000058\beta\gamma + 0.000985\beta\delta + 0.000003n^2 - 0.000156\beta^2; \quad (1)$$

$$\nu = 111.31066\ 2.24234 + n + 5.31882\beta - 25.35437\gamma\ 47.72603 + \delta - -0.01697n\gamma + 0.05532\beta\gamma + 0.90515\beta\delta - 0.00333n^2 - 0.11514\beta^2 + 0.50709\gamma^2 - 26.4688\delta^2; \quad (2)$$

corn

$$M = 1.59791 - 0.00136n + 0.01552\beta - 0.00904\gamma + 0.07899\delta + 0.00014\beta\gamma + 0.00161\gamma\delta - 0.0003\beta^2 + 0.07667\delta^2; \quad (3)$$

$$\nu = 50.6946 - 0.3891n + 0.7942\beta + 4.2634\gamma - 0.8174\delta + 0.0065n\gamma - 0.5294\beta\delta + 0.5103\gamma\delta + 0.0011n^2 - 0.1004\gamma^2; \quad (4)$$

Using the obtained regression equations build graphical dependencies characterizing the impact of variables on the optimization criteria (grinding module M and the coefficient of variation of fractional composition *v).*

Examples of such dependencies are shown in Fig. 3 and 4.

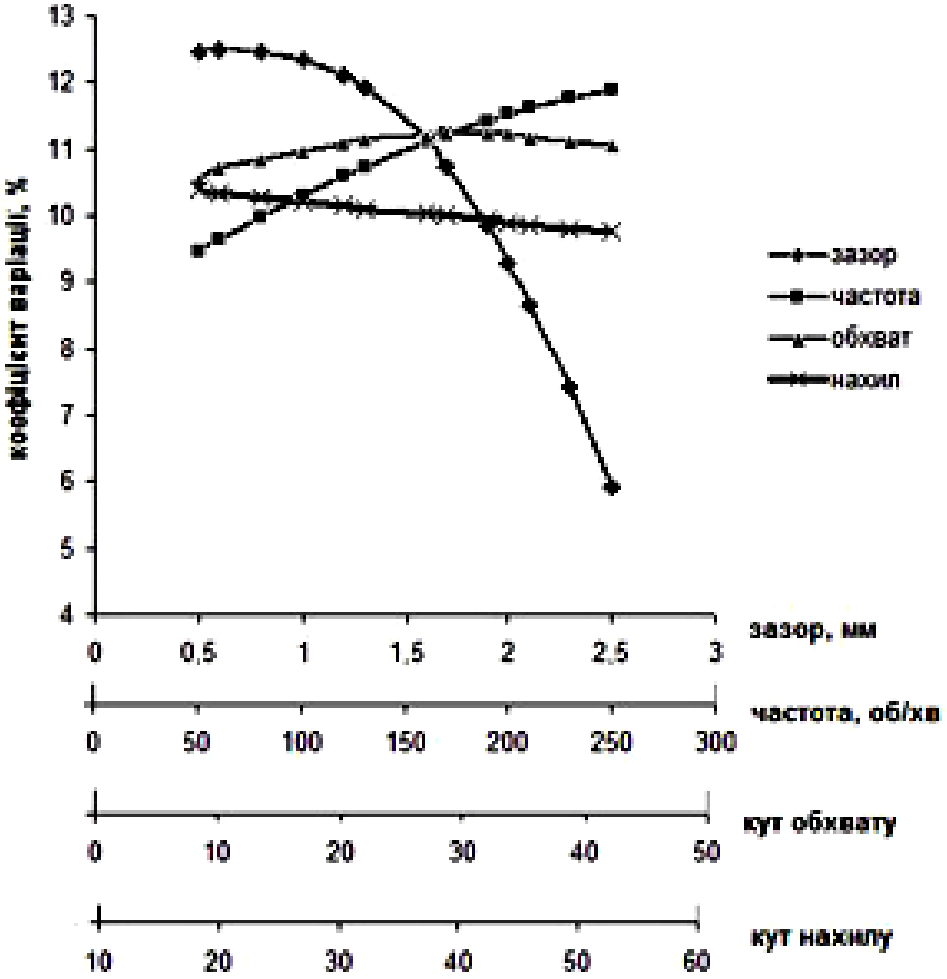

Fig. 3. Dependence of the coefficient of variation of variables when grinding barley

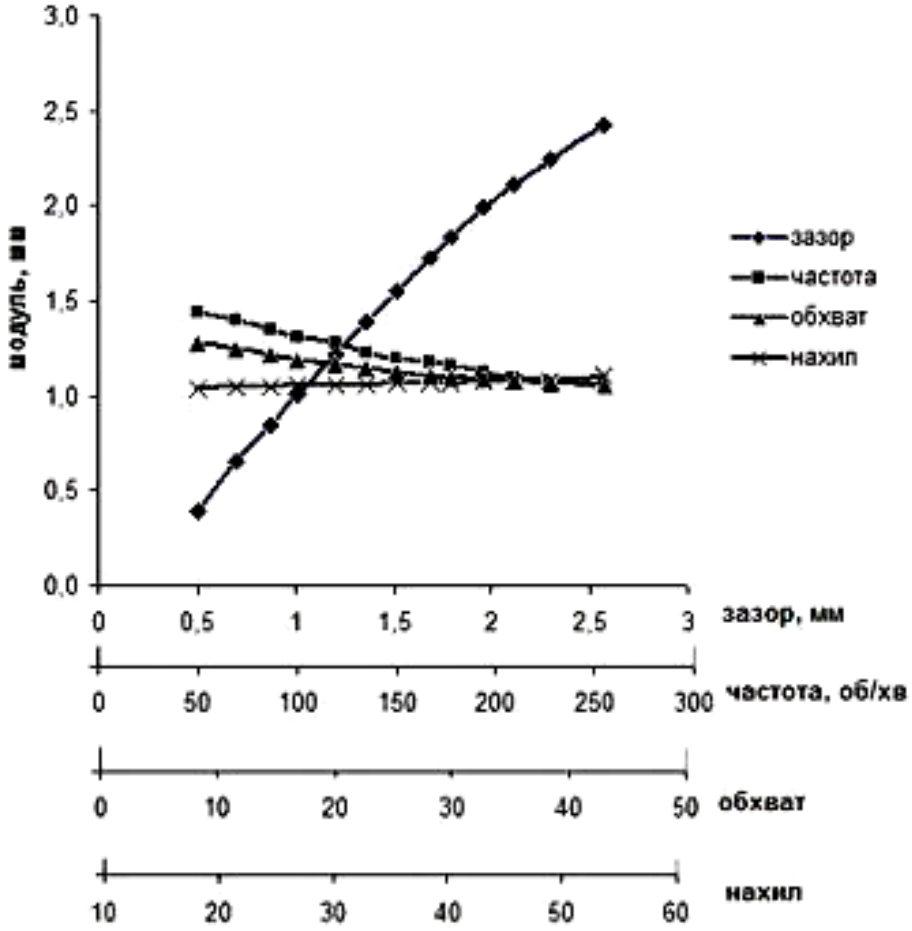

Fig. 4. Dependence of grinding module variables when grinding barley

Analysis of the dependencies that:

- Increase in the frequency of rotation of roller *n* leads to a reduction in size of the product, but it increases the unevenness of its fractional composition;

- Angle guide *β*virtually no effect on the value of grinding module *M* and did not significantly change the coefficient of variation ν;

- Angle girth γ roller deck does not exercise significant influence on the uniformity of the fractional composition of grinding products, however, its increase leads to a slight decrease in size grinding;

- The most significant effect on the performance quality of the grinding gap has value *δ* between Waltz and deck. However, the magnitude of the gap is set according to the specified size by crushing zootechnical requirements according to the type of animal.

Based on the analysis determined the rational parameters odnovaltsovoho (valtsedekovoho) Slasher cereal feed depending on the zootechnical requirements and the type of grain.

Conclusions

Experimental studies dependencies quality indicators grain refinement process of controlled parameters: rotational speed roller, the angle of inclination of the guide *β*, The angle circumference deck γ and the output gap *δ*. Experimentally proved that achieve a given quality provided by varying the grinding gap between the deck and Rollers and roller rotation speed.

Based on the research nature of the dependencies identified rational parameters odnovaltsovoho Cutter according to a given grain size and type of material.

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Pryvedenы эksperymentalnыh Results of research of influence of major parameters odnovaltsovoy zernodrobylky on Quality Indicator produktov yzmelchenyya.

Zernovыe feed, odnovaltsovaya zernodrobylka module grinding, utilization rate variation.

The results of experimental researches of influence of basic parameters of single-roll corn-crusher upon the indexes of quality of products of grinding are presented.

Corn forage, single-roll corn-crusher, module of grinding, coefficient of variation.