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UNTRADITIONAL COMPOUND FEED ADDITIONS

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Adding corn stalks to the feed improves the quality characteristics of the feed when additional corn filler is used. It has been shown that the use of corn additive is superior to high-quality straw by 0.4 k.o.d. per kg A more complete comparative analysis of the chemical composition of corn stalks shows that at the stage of full maturity the stalks contain slightly more starch than the husk, but much less than the grain. There are three times more water-soluble carbohydrates than in grain. The degree of rod preparation, that is, the degree of grinding of raw materials and its moisture, has a significant impact on the properties of the final product.

Key words: *supplements, corn, component, rod, combined fodder.*

Introduction. Non-traditional ingredients are used in the production of compound feed to reduce production costs while maintaining or improving the economic performance of poultry. Experts claim that the use of non-traditional feeds allows replacing expensive feed ingredients with cheaper ones, ensuring lean production at many food industry enterprises and meeting the rapidly growing demand for feed. Grass flour is usually made from a mixture of alfalfa, clover, legumes and cereals, as well as some pasture and other crops [1,5,6 11]. Parts of the stems are the oldest vitamin food. Before and during flowering, it contains a lot of complete protein, carotenoids, all B vitamins, vitamin E, three times more manganese and iron, and five times more copper and zinc than technical clover [2,5,7,10]. Dried products are of great importance. Meals contain more than 20% protein, about 5% fat and up to 12% fiber. Nutrients (µg) in 1 g of flour: 150-250 carotenoids, 25 vitamin E, 12 riboflavin, 1000 ascorbic acid, 25 vitamin K [3,4,8 9]. The nutrients in flour are similar to those found in "green grass". The composition of corn stalks shows that they are superior to good-quality straw in terms of the number of nutritional units (0.4 fodder units per kg) [1,8,9].

Research materials and methods. One of the most important physical and mechanical properties of food products that require grinding is their strength, which affects the grinding process and the choice of the principle of operation of the grinding equipment. It has been established that during material processing, material moisture has a significant effect on grinding. The analysis of the grinding rate of the material was carried out using a laboratory grinder.

Table 1. Grinding process indicators.

Moisture guest material y,W%	Degree of grinding, d	Specific work for grinding A, J/kg	The average diameter of the material after D.mm i, d mm	The average size of the pieces is up to	Total power for the grinding process, No., kW	Material processing time lu, s
8	47.36	70.4	3.8	180	11.8	90
12	61.4	81.3	2.93	180	13.6	90
14	52.4	74.44	3.43	180	12.5	90
16	45.8	71.21	3.93	180	11.9	90

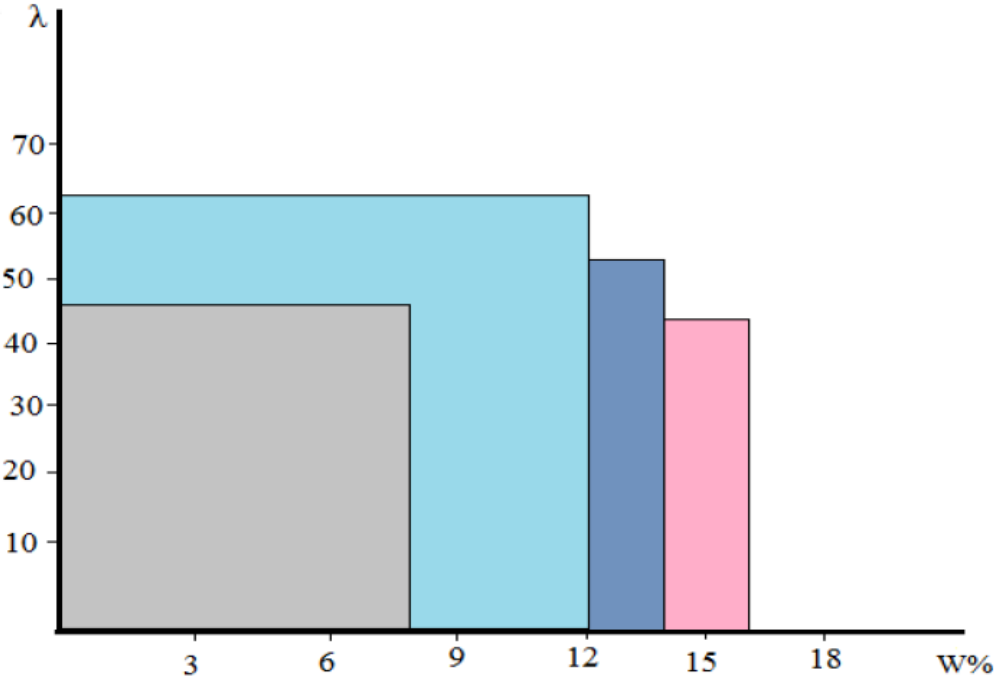

Fig. 1. Dependence between the degree of grinding and the moisture content of raw materials.

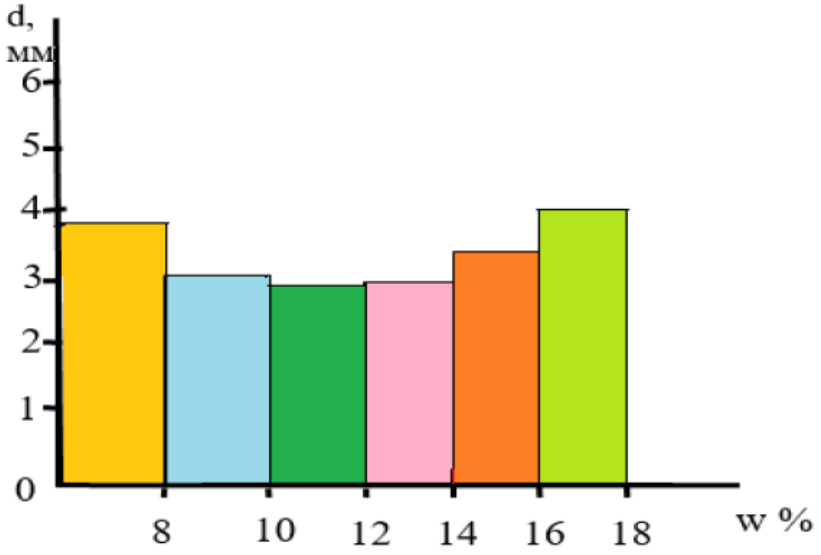

Fig. 2. Dependence of the weighted average diameter of the crushed particles on the moisture content of the raw material

Samples with different moisture contents were analyzed to evaluate the grinding process. At the same time, changes in the diameter of crushed particles with different moisture content were studied. The results showed that the maximum shear stress decreases with an increase in the moisture content of the bars. The analysis of the received data made it possible to choose the most effective technological mode of chipping.

For the purpose of comparative analysis of the typical composition of compound feed and bulk feed with the addition of MBLZ, it was established that the addition of 25% of additional components to the composition of compound feed allows to reduce the cost of grain flour (forage wheat, barley) against the background of a certain number of feed units.

Conclusions. The analysis of the conducted research made it possible to draw a conclusion about the expediency of using corn stalks, which make up 25% of the weight of the cob. The main requirement for effective feeding of stalks to livestock is their grinding to a constant granulometric composition of 2-4 mm. When feeding livestock, it is recommended to chop stems up to 5 mm and contain at least 70% of particles up to 4 mm in size.

A humidity of 14% can be recommended for grinding. This has a positive effect on energy consumption and only slightly increases the efficiency of the process, but is the most favorable from the point of view of grinding.

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HOMOGENITY OF COMBINED FEEDS

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For practical calculations of the mixing process, the evaluation of the quality of the process of mixing feed ingredients in order to determine the optimal mode for obtaining homogeneous products of different formulations can be carried out on the basis of the law of diffusion. The main direction of the further development of the compound feed industry is to solve the urgent task of improving equipment and technology in order to further increase the level of use of feed ingredients, improve quality and expand the range of final products. When producing complete feed, it is important to thoroughly mix each ingredient before granulating or briquetting.

Key words: *supplements, corn, component, rod, combined fodder.*

Introduction. The most important technological operations in the production of compound feed are crushing, separation, mixing and compaction of feed mass fractions. Each of the previous operations must create sufficient conditions for the optimal execution of the next cycle of continuous batch processing. Pressed feed is less prone to oxidation due to a low active surface, which increases durability and reduces load and losses during transportation [2,3,4,7]. The stability of the quality indicators of compound feed is determined by several factors, the most important of which is the homogeneity of the mixing of components in a batch or continuous mixer [1,5.6].