

Scientific and Technical Solutions for Providing Technologies and Technical Means for Crushing Coarse and Grain Feed in Animal Husbandry

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Introduction. It is known that animal husbandry is the main branch of agriculture in Uzbekistan. For this reason, our State and Government attach great importance to the development of animal husbandry.

In 2017-2021, special emphasis was placed on the modernization and rapid development of agriculture in the five priority directions of the development of the Republic of Uzbekistan. It is planned to increase meat production by 105.6% and milk production by 108.1% in the near future due to food supply [1,2].

Today, animal husbandry in Uzbekistan is developed mainly in private assistants and peasant farms, where 8.5 million of the total number of cattle and 15 million of sheep in our republic are raised, and this is more than 85 percent of the total number of livestock [3]. Animal husbandry in personal assistant and peasant farms is characterized by a small number of livestock and high productivity despite the low costs. But one of the main problems in these farms is the primitiveness of production and the high level of manual labor due to the lack of equipment suitable for their needs and requirements, including feed preparation devices.

Livestock in these farms are mainly fed with corn, alfalfa and dried stalks of wild grasses (gumai, etc.) and straw. However, feeding livestock by grinding coarse hay and mixing it with soft fodder leads to an increase in their productivity and good growth [4-7]. Today, hay is fed to livestock without being chopped due to the lack of small, compact feed preparation equipment used for small farms to grind hay and mix it with bulk feed. As a result, about 25-30 percent of the feed goes to the waste, its perishability is high and the efficiency of its use is low. In some cases, the hay is crushed with hand-powered grinders and mixed with highly concentrated feed. This leads to the lengthening of the work and the increase in labor costs.

The existing IGK-30, ISK-3.0 and other shredders for grinding dry hay are designed for large farms [8-10], due to their extremely large metal and energy capacity and high price, today the number of goods it is ineffective when used in small farmers and private subsidiary farms.

This situation, in turn, requires serious attention, and requires the development of mini-feed preparation units that are personal assistants that fully satisfy farmers and farms in terms of productivity and energy consumption, and that grind and mix feed that are not inferior to existing large-sized machines in terms of work quality.

Research shows that farmers and private farms strive to increase the amount of products obtained from livestock, as well as the individual use of technical means. Based on this, the development of a device for grinding and mixing feed intended for individual use by farmers, personal assistants and farms is one of the urgent tasks.

For this reason, at the same time, research work is being carried out on the development of a hash grinder-crusher used for grinding coarse stalks and a grain grinder-crusher used for grinding

nutritious grains [11,12]. In the course of the research, prototypes of them were created and their experimental work was carried out.

Materials and methods. Conducting pilot-testing of crushers-crushers RD 10.23.6-90 "Testing of agricultural machinery. Machines for harvesting forage crops with crushing" and OST-70.19.2-83 "Testing of agricultural machinery. Machines and equipment for preparing feed. Research programs and methods" methodical manuals were relied upon.

Corn, wheat stalks, alfalfa hay and straw were used in the test work of the hash grinder-crusher, while in the test work of the grain grinder-crusher, corn grain and bran were used as processed materials. During the trial period, it was ensured that they were in the range of 10-14 percent.

Results and their analysis. During the tests, unique results were achieved in both crusher-crushers.

In particular, the tests of the reed crusher-crusher in the above parameters and operating modes showed that the crushing and cracking of stems in all types of coarse reeds processed in it was at the required level.

The content of pieces of stalks 3-8 cm long in the ground mass was 86.4% in the treatment of straw, 84.9% in the treatment of corn stalks, 87.2% in the treatment of wheat stalks, and this indicator was 78.7% in the treatment of alfalfa hay. Cracking or crushing of stems was higher than 90 percent in all types of hay.

On the other hand, in the tests of the grain grinder-crusher with the specified parameters and working modes, the degree of grinding in the processing of corn grain when it is passed through the grain grinder-crusher for the first time is 22.9 percent of the grinding module up to 2 mm, between 2-3 mm is 46.4 percent, and from 3 mm older ones made up 30.7 percent.

The same indicators were 89.3 percent, 7.5 percent, and 3.2 percent, respectively, when the crushed material was passed through the crusher-crusher for the second time.

When corn husks were also ground in a grain grinder-crusher, their degree of grinding was slightly different.

Conclusion. According to the test results of both types of shredder-crusher, it can be said that the working quality indicators of the chopper-crusher intended for the processing of rough chopsticks meet the specified requirements. However, milled forage is suitable for feeding dairy cows, one-year-old cattle and sheep, and for feeding calves and lambs, as well as for greater uptake by livestock, a finer level of grinding is required. In addition, if the desired level of crushing is achieved in one passage of grains through a crusher-crusher, energy and other costs are also reduced. Based on this, it is necessary to continue the research on the grain grinder-crusher and to bring its work quality indicators to the specified level.

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