

TRENDS IN IMPROVING AND DEVELOPING NEW TECHNOLOGIES AND EQUIPMENT FOR GRAIN STORAGE AND PRODUCTION OF MIXED FODDERS

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Trends in improving and developing new technologies and equipment for grain storage and production of mixed fodders: the use of budget new grain dryers; using of devices for filling and unloading big-bags and bags, ensuring unimpeded unloading of grain processing products, feed and mixed fodder from silos and bunkers; Increase in productivity and increase the level of automation of operation and maintenance of hammer crushers, other grain shredders, and pellet presses; Distribution of the vacuum application of liquid components to the composition of mixed fodders; optimization of press extruders and the combination of many technological operations on their basis: application of equipment and technologies of feed mills to produce bio-pellets from agricultural raw materials of plant origin and by-products of its processing; the introduction of continuous monitoring of temperature and moisture content in the grain, its processed products and mixed fodders.

The technologies which are used in the food industry are far from perfect now. Leading scientific laboratories and universities of all over the world are actively developing innovative technologies that allow increasing the ecological purity of produced products, their nutritional value, reducing the energy intensity of processes, and increasing the yield of products.

The use of budgetary grain dryers of a new generation is spreading, which allows reducing energy costs by 20–30%. For example, the company TORNUM AB (Sweden), thanks to the extensive use of the principle of heat recovery, has reduced energy consumption for drying grain by 30%.

The American company «Mathews Company» has developed a series of high-performance grain dryers of conductive type, which avoids contamination of the grain with harmful components of the combustion products of the fuel.

The use of devices for filling and unloading big-bags and bags, ensuring unimpeded unloading of grain processing products, feed and

mixed fodder from silos and bunkers is spreading. Thus, European Machine Trading (Netherlands) and Derichs GmbH (Germany) developed improved models of installations for filling big-bags. Morillon (France) demonstrated improved models of horizontal auger silo unloaders of round shape.

Derichs GmbH (Germany) exhibited an improved model of a rotary silo unloader, and Silexport international SAS (France) demonstrated modular vibrodes for highly efficient silo unloading. Innovative resource-saving technologies for processing vegetable raw materials in food and feed products is the development of new ways to intensify the technological processes of grain processing and food industries on the basis of using organized transitional regimes, limiting material and specific energy inputs, improving the quality and energy performance of products and the timing of its storage. Complex solutions have been developed to improve the ecological state of grain drying, to prepare raw materials for processing into flour, to obtain food and feed products with specified indicators on the basis of minimized specific material and energy resources.

The technology of cooling by the directed air streams of the granular production is developed and offered by the company provides decrease in quantity of losses of production in the form of emissions of polluting substances in atmosphere. It is scientifically justified the expediency of preparing the grain for grinding with providing the value of the peeling index of 6–8% and experimentally established properties and features of the technology of grain peeling using self-sharpened abrasive surfaces.

The expediency of intensification of the cold method of high-temperature grain processing due to its preliminary peeling is proved, which helps to attract the potential of the aleuron layer to increase the biological value of the flour. The possibility of enriching food and feed products of essential oil medicinal herbs with the aim of improving the quality of finished products was studied. The results of the developed measures are confirmed by their wide use. Reduced the number of harmful emissions of industrial enterprises by 10–15%.

The fodder industry can get a powerful impetus for further development, combining international experience and knowledge in the production of mixed fodder and feed mixtures, especially low-value plant raw materials and new possibilities for producing biopellet. At least the feed industry of Europe and the world have already gone along this path. The way, which not only allows the production of high-quality mixed fodder, but also alternative sources of energy.