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THE BASIS OF THE QUALITY OF GRAIN CORN - CONTROL OF MYCOTOXINS IN IT.

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The data about the dangers of contamination of corn by fungi and the need to monitor for contamination with mycotoxins.

Grain corn, molds, mycotoxins, storage modes, methods of storage, post harvest handling, granaries.

Thanks to genetic diversity and excellent prospects offered by hybridization and numerous channels, corn is one of the most important crops for agriculture in the world.

Each year, the area under maize increased simultaneously with the increase in productivity. Economies of scale corn is natural, because this highly cereals used as fodder, and food and technical purposes.

Corn is the primary forage in the world. The volume of production is constantly increasing. As fodder crop is used for livestock concentrate feed, silage and green mass. More valuable feed is corn, which has 9-12% protein, 65-70% carbohydrates, 8.4% oil and 2% minerals. 100 kg of corn contains 134 food. units. and up to 8 kg of digestible protein. In a coarse flour, bran it is well digested and absorbed by the animals. Since corn silage are valuable for cattle silage through the mass of plants - stalks, leaves and cobs. It has an important place in the green line, providing the animal green mass rich in carbohydrates and carotene [1].

According Maisadour Semences, now split of corn use in Europe is a clear trend towards increased use of corn processing industries, namely the production of starch - 18% for processing cereal and flour - 8%, etc. [2].

Since ancient times, found food corn use. Corn flour is used in confectionery industry for making biscuits, cookies, casseroles. Produce food grain flakes, popcorn (popcorn), croup. In addition, the contents of protein (12.5%) higher than other corn grits (buckwheat, barley, millet). Food produced from grain starch syrup, sugar. Eaten unripe grain, especially in the form of sweet corn cobs cooked. Corn germ extract vegetable oil, which is not only high-calorie food, but also has medicinal properties: contains lecithin, which lowers cholesterol and prevents atherosclerosis.

In addition, corn is used to produce various soft drinks, beers pinostiykyh, glycerol, organic acids (lactic, citric, acetic) ethanol. With stems and cores ears produce paper pulp, acetone, methanol and others. It is estimated that corn produced over 300 different products, many of which are raw materials for the manufacture of other products. For example, from corn syrup producing rubber, paints, various preservatives, solvents, oils, etc. [1].

With the growth of productivity and increased corn acreage, producers of these products often do not pay attention to its quality. In agriculture, it is important not only to get high yields, but also have high quality products. Since most production of corn is used for animal feed or, or to food production, control its quality must be a priority.

Product quality crops formed in the process of growing, and its change occurs at the stages of growing, and during post-harvest handling and storage. Product quality can worsen many factors as human or abiotic and biotic type. Considerable damage as crops provide microorganisms, especially those that produce mycotoxins.

Infection corn mushrooms and their metabolic products - mycotoxins present a serious problem of grain farms, feed companies and livestock farms. This has significant economic damage, as the basis of animal diet is grain, which is the main source of mycotoxins. Mycotoxin contamination of grain possible at all stages of production, storage, processing and transportation. Thus, the problem affects a wide range of enterprises as the feed and food industry.

Microscopic fungi in grains, conventionally divided into field mushrooms and fungi storage. Field mushrooms fall during grain growth and harvesting, storing mushrooms - during transport and storage of grain. Infection grain field mushrooms can occur both outside (spores carried by rain, wind, etc.) and inside (with contaminated soil) [3].

Grain crops that were grown or gathered during adverse weather conditions collected in late autumn on the pitch, as well as grain, timely collected, but not dried or stored in high humidity may be infected toksyhenymy microscopic fungi and acquire as a result of the toxic properties.

Microorganisms - our constant companions. The most common ones are mold fungi that combine several thousand species. Some molds are capable of producing toxins - mycotoxins [4].

Mycotoxins - is secondary metabolites produced by microscopic fungi that develop in grains, fruits, berries and their products. Since the fungus Fusarium spp. can develop in grain form mycotoxins and the period of harvest. Other fungi also infect grain before harvest, but form mycotoxins during storage.

Many species of mushrooms only partially reduce development, or lead to poor food conversion, but some mycotoxins such as aflatoxins, ochratoxin, zearalenone, tryhotetsyn (deoxynivalenol, nivalenol), fumonisiny are more intense. These toxins are found in different regions and in certain situations, so prior knowledge of the circumstances related to their development, significantly reduce the risk mycotoxicoses [5].

The main representatives of mycotoxins - a trihotetsenovi mycotoxins that are synthesized fungi genera Fusarium, Cephalosporium, Myrothecium, Stachybotrys, Trichoderma and Trichothecium; containing 12 13-epoksiseskviterpenoidnyy balance (trihotekan); about 100 known mycotoxins trihotetsenovyh [6].

1. In Ukraine, due to the nature of climate crops susceptible to destruction by fungi genus Fusarium, which can produce mycotoxins in the field. Control to assess the risks associated with the presence of mycotoxins in grains, insufficient. This is due to a limited number of laboratories where to carry out accurate analysis

for the presence of mycotoxins as well as the high cost of these tests. But the problem is well known mycotoxin livestock and poultry. The risk of mycotoxicoses usually associated with toxins produced by fungi of genus Fusarium - T-2 toxin and zearalenone vomitoksinom.

Another reason of infection by fungi corn is violation technologies postharvest handling and storage of grain. Especially developed significantly in grain fungi assembled with high humidity (raw grain) or piznoosinniy and even winter. Equally important influence on the development of fungi has the process of collection. Well adjusted combine harvester (speed, configuration threshing drum cleaning) ensures clean grain and reduces the risk of crushing or cracking seeds. Increase travmovanosti grain, high impurity content are important factors intensify the development of fungi.

Terms of post harvest handling, especially drying, are crucial for the quality of grain and its industrial value, risks damaging effect on physiological properties of grains of merchantability and fitness for use. Too hot or too powerful drying can damage corn, reduce its usefulness, particularly for food processing purposes. Drying temperature is set depending on the further use of grain. During this process, it is necessary to control cracking and damage. To prevent their occurrence, corn processed soft modes for reducing moisture of 4-5% for one passage in the dryer shaft type [8, 9].

Another factor that influences the intensification of fungi in the grain mass, is a way to store it. Different types of stored corn for differently. The greatest influence on the stability of embankments corn during storage belongs temperature and humidity. Grain corn should be stored separately: raw (17% or more), wet (15,6-17%), medium dry (15.5%) and dry (14%). Dry grain is stored in the repository with any height of the embankment. Grains average dryness at a temperature of 100C stored in a mound height of 2-2.5 m and no more. When storing maize in silos it must be cooled to ambient temperature and lay with humidity not more than 14%.

The correct type of storage depending on the type of culture, way of storage and grain moisture to help minimize crop losses and natural contamination of diseases.

All storage are divided into three types: ground composition, concrete silos and silage metal. They have different functional orientation and adaptability.

Despite the relatively primitive design, technological composition has a number of advantages. Because it provides stable storage mode and minimum grain damage, it is best used to store seed and food grain.

Concrete silo as ground staff, well protected from the grain temperature and the relative humidity of the outside air. In addition, it can often restart without poboyachys deteriorating operating performance. It is suitable for both temporary and long-term storage of grain stocks.

The metallic silo has the highest technical performance indicators: wide dimension-type series, the possibility of mechanization, timely quality control of grain blowing in a different mode. However, it does not protect the grain from the external environment, especially in wall surface layers of the embankment. Therefore, it is best to use both operational capacity and concentration or temporary storage units. [10]

So to solve this problem commodity grain production need:- Clearly comply with cultivation technologies, harvesting and post harvest handling of grain, especially to protect crops from disease and pests - Depending on the quality of the harvest, to an appropriate post-harvest handling, which would minimalizuvala development mikotoksychnyy fungi and their effects on grain weight. Particular attention is paid to the drying parameters and operations of loading and unloading of grain;

- Create the necessary conditions and control the storage of grain and its products. Monitor the organoleptic properties and moisture and grain temperature, temperature, humidity and gas composition of air;

- Carry out regular laboratory control of mycotoxins in grain at all stages of processing.

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