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УДК 811.111

**Губницький О.О.**

**Марковська А.В.**

## **GRAIN STORAGE IN METAL SILOS (ЗБЕРІГАННЯ ЗЕРНА У МЕТАЛЕВИХ СИЛОСАХ)**

*У статті подані особливості зберігання зернової маси у металевому силосі, переваги зберігання зерна у силосі, конструктивні особливості будови а також пропозиції щодо поліпшення зберігання.*

**Ключові слова:** зберігання зерна, металевий силос , зерно.

*This article describes the features of grain storage in metal silos, the benefits of grain storage in silos, design features of the structure and suggestions for improving storage.*

**Key words:** grain storage, metal silo, grain.

Creation of different modifications of granaries and improvement of technology of its storage of food and fodder grain of main agricultural crops is an important task in our time.

Grain storage between harvests as well as for a longer period is a priority objective. It is also important to minimise the costs of grain storage without compromising its lifetime performance.

Metal silos are nowadays the most widespread grain storage facilities in Ukrainian households. Recently, their number is growing steadily, given the desire of many farmers to develop self-treatment and storage crops.

The silo method for grain storage is the most popular among farms among other methods. The height of the silo is more than 1.5 times the size of the cross-wall. Metal silos are often installed without a solid surface to support the weight of the structure. They are more ventilated than concrete silos. Granary storage in a 100% mechanization and in recalculation on the surface the lowest level of costs.

Advantages of the metal bins: Fast installation through the use of prefabricated assemblies, wide size range, mechanization of mounting and dismounting works, the possibility of ventilation, high sealing, control of storage conditions, the small area makes it possible to install new silos in existing facilities.

Metal silo walls are made of aluminium alloys and various steels.

The temperature of grain mass is the most important indicator, which characterizes its condition. Temperature sensors are used to determine the grain temperature in metal silos.

If the concentration of acid in the gas mixture is more than 10 %, the survival rate of micro-organisms and lumps in the grain mass is very high. It should be noted that the process of self-ignition of grain is terminated at reducing the concentration of acidity to 8-10%.

In metal silos stored reliably dry and cooled grain (with volatility not more than 13 - 14%). This is ensured by active ventilation.

In the case of storage of grain products with different levels of volatility is

appropriate to use sealed metal silos, fertilized after the loading of grain gas medium with a reduced amount of acid. Nitrogen should be used as the main component of the gas mixture. The filling time of the silo by means of a membrane system is approximately one day.

The optimum quantity of acid in the media for the efficient grain preservation in the gas mixture is 1-3 % with intake volatility of 45-75 %. The initial concentration should be 3-5 % acidity.

Necessary of the regulated gas environment (RGE) is achieved by nitrogen blowing of the silo to the concentration level of 3-5 %, taking into account that grain breathing accelerates the optimal RGE composition. If the acidity concentration is less than 0.3% or if the concentration exceeds 10%, the silo is blown additionally.

The proposed method of conserving grain of different moisture content by filling the silo space with inert gaseous medium allows to control the "breathing" of the stored grain.

The main advantage of this preservation method is the reduced lifespan of comas at all stages of their development.

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