ISSN NO: 2770-0003
Date of Publication: 26-02-2024

Methods Of Improving Technological Quality In Cleaning Grain Mixtures From Waste Based On Gost Requirements

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Annotation
In this article, the main feature of the technological process in the grain cleaning department is the effective process of dry and wet cleaning of the grain surface. Taking into account the structural and mechanical properties of wheat varieties grown in Uzbekistan, and soil and climatic conditions, the process of cleaning the grain surface consists of several stages. In addition to reducing their ash content during dry and wet processing of the upper layers of grains, information is provided on the technology for cleaning grains from various microorganisms.
Key words: cocoon, gluten, grinding, separator, flour feed, sieve, cellular surface, pneumatic separating channel, wheat microstructures.

Introduction

One of the greatest discoveries of mankind was the cultivation of grain crops, planting their seeds in the field, and learning how to grow a large amount of grain. Another great discovery of mankind was making flour from wheat grain, which was used to make bread and bakery products from it. Humanity continued its research and learned how to make porridge from grain. Today, cereals made from cereals are considered as a daily food for people. Rice made from rice grains is extremely suitable for the human body. 96% of rice is digestible in the human body [1]. Currently, China consumes 120 kg per capita, Japan 104 kg, Pakistan 98 kg and India 66 kg. Today, a lot of grain products are grown around the world. It is very important to preserve and process the cultivated grain without perishing.

Today, the market economy, regardless of ownership, imposes serious requirements on raw materials, product quality and its improvement to every business manager, engineer, specialist, and employee. The management system in the agrarian sector has been fundamentally changed and the shaping of the farming movement is aimed at the rational use of available land resources by the state, providing the population with food needs in terms of quantity and quality [2].

Standards for storage and processing of grain are set by the state. Storage and processing processes are organized based on these standards [3].

Grain quality indicators according to GOST: the norm is as follows.

Moisture - not more than 14.5%; Ash content for pure wheat - 1.97%; Foreign impurities - 2%, (including mineral impurities - 0.1%, harmful impurities - 0.01%); Mixtures with B wheat - 5%; Natural weight (natura) - from 750 g/l (k.e.); Gluten content - 23% R gr.; IDK quality - 100 (instrument unit, load.e.); The quality indicators of the grain received at the elevators are not high (Moisture - 14.5%); Ash content for pure wheat - 1.97%; Foreign impurities - 2%, (including mineral impurities - 0.2%, harmful impurities - 0.01%); B wheat mixtures - 5%; Natural weight (natura) - from 750 g/l (k.e.); Gluten content - 23% R gr.; IDK quality - 100 (instrument unit, load.e.); Transparency - not less than 40%; Injured - not allowed. Quality indicators of grain entering the grain cleaning department Moisture - 12.5% is not high; Ash content for pure wheat - 1.92%; Foreign impurities - 1%, (including mineral impurities - 0.1%), harmful impurities - 0.01%); Mixtures with B wheat - 4%>; Natural weight (natura) - from 750 g/l (k.e.); Gluten content - 23% R gr.; 1DK quality - 100 (tool unit, load.e.); Transparency - not less than 40%; It cannot be damaged [4].

Purity is important in bringing the values of raw materials to the required level based on the requirements of the specified GOST.

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Physical properties in quality improvement

Determination of physico-chemical properties of solid and liquid materials is based on a number of indicators [5].

The proper use of these indicators depends on the engineer's task at hand. Since grain is the main raw material in the production of flour and cereal products, the content of the technological process requires the effective use of the following indicators.

- ✓ geometric description of grain: size, surface area, their ratio, grain shape;
- ✓ natural weight of grain;
- ✓ Weight of 1000 grains;
- ✓ grain transparency;
- ✓ small size and density of grain.

Geometric description of grain.

Depending on the shape of the grain and its size, the technological drawings of the separator, air separator and their working parts, trier and grinding, whitener and grain separating machines are determined [6]. Volume ratio and grain surface area are important in GTI processes. The natural weight of grain The weight of 1 liter of grain in grams is called the natural weight of grain. In some countries, it is accepted as a pound (0.453 kg or 35.1 in a bushel). The following factors affect grain weight: grain moisture, size, shape, dirtiness. The normal weight of this wheat grain is 750 g/1. If the natural weight of grain is less than 740 g/1, the yield of flour is reduced by 1%.

Mass of 1000 grains of wheat. This indicator depends on the grain size, transparency, density and affects the technological properties of the grain. If the weight of 1000 wheat grains is more than 40 g, the output of flour will be more than 3-5%.

Transparency of grain:

Transparency is an indicator property that reflects the microstructure of wheat. The endosperm part is easily separated from the transparent grain during the milling process, improving the baking properties and quality of the flour. For the formation of the "pomol" batch during weighing, it is desirable that the transparency should be 50-60%.

The quality of the grain sent to the grain cleaning department of the mill Today, flour mills are equipped with modern, high-performance equipment, and are adapted to clean grains based on standard requirements and change their composition in a positive way. In order to obtain high-quality flour from grains, certain standard requirements are set for flour.

It is recommended that the initial moisture content of grain for flour production is not more than 12.5% to 13.5%, the amount of foreign impurities is 2%, of which harmful waste should not exceed 0.2%, and the amount of damaged grains should not exceed 1%. The amount of grain waste should not exceed 5%, of which wheat should not exceed 4%, rye and moldy grain should not exceed 3%. Grains from which flour is obtained must not be infected with Fusarium disease.

The stages in grain cleaning departments are as follows:

a) separation;
b) hydrodynamic processing (GTI);
g) treatment of the upper layer of grain;
d) preparation of the towable grain mixture;

Grain cleaning is carried out in four stages:

The first stage of the separation process is to separate the initial mixture or its components according to the same characteristics. Based on this, a device that separates any mixture based on one or two characteristics in a device is called a separator. Despite the fact that the initial composition of the grain batch has been cleaned in grain refining enterprises and farms, they contain various impurities (organic and mineral substances, weed seeds and other waste) [7].

Separation of these compounds by mechanical means is possible only in grain crops. There are two types of separation process in flour and grain and fodder enterprises: - cleaning of substances that spoil the mass of grain and affect its quality when weighing grain; - it is recommended to divide the grain into fractions (according to size or quality) to weigh grains separately. A separator is a device that separates spillable mixtures with working bodies such as a sieve, cellular surface, pneumoseparating channel,

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magnetic and electrostatic elements. According to this, the separators working according to this are conventionally divided into two groups: simple and complex separators.

Figure 1. Separator for separation of grain mixtures

The efficiency of separation of grain mixtures depends on the operation procedure and parameters of the separator, that is, on the amount of the initial mixture falling into the separator per unit of time; to the processing time in the separator; the divisibility of the physical composition of the mixture is understood [8, 9].

So, currently, this separator shown above has been proven in practice to be dependent on the parametric work characteristics of grain raw materials. Based on our article, we recommend that the advantage of this technology is:

Figure 2: Seed and grain magnetic separator scheme

The characteristics of this technology are as follows:

- ✓ Use: removal of debris, soil;
- ✓ Program command: cleaning of various grains and pulses;
- ✓ Class: high magnetic power;
- ✓ Specifications: SGS, ISO9001.

Model number.	Codi	Production capacity
5XCX-5	84371090	300 t/h

This 5XCX-5 magnetic separator is used to separate metals or magnetic soil fragments from grain.

Grain mixed with metals and soil particles through a closed strong magnetic field at a suitable rotation speed. Depending on the speed and quality of rotations of the magnetic field, metal, soil and soil particles are separated from the grain.

Magnetic Separator - 304 stainless steel construction, also protected by a hard magnetic coating for less magnetic flux. Based on its characteristics, it is important to introduce an efficient device instead of the grain cleaning technologies we have today.

In conclusion, it can be said that in today's globalized era, innovative types of production have been put into practice. Therefore, energy efficiency and quality of work are also of particular importance, based on this, the technology we promote is also compatible with today's production requirements.

Adabiyotlar

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ISSN NO: 2770-0003
Date of Publication: 26-02-2024

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