



STUDYING THE WEIGHT OF 1000 GRAINS OF CEREALS AND LEGUMES

Abdashimova Khumora

3rd grade student of

Gulistan State University, Faculty of Production

<https://www.doi.org/10.37547/ejmns-v03-i02-p1-20>

ARTICLE INFO

Received: 30th January 2023

Accepted: 10th February 2023

Online: 11th February 2023

KEY WORDS

*Analysis board, Spatula,
Electronic scale, Grain samples.*

ABSTRACT

The mass of 1000 grains also evaluates the grain density, studying the influence of the mass of 1000 grains on the technological properties of production, the effect of the mass of 1000 grains on grain and seeds, grain consistency, grain hardness.

INTRODUCTION

The mass of 1000 grains determines its size and size. The larger the grain, the greater the mass of 1000 grains. Also, the mass of 1000 grains also evaluates the grain density. The greater the mass of 1000 grains in equal dimensions This indicates that a large amount of nutrients have been accumulated in this grain. Grains and seeds with a large mass of 1000 grains have good technological properties, that is, a large amount of finished products (flour, semolina) output. .Because in such grains, the quantity allows to increase the quality and quantity of the valuable product. there is a lot of endosperm (pill) and a small part of the shell. All other conditions being equal, the mass of grain with high moisture content is also large. Therefore, the mass of 1000 grains is expressed as a relative amount of dry matter. When preparing the grain for analysis, two measurements are taken from the middle sample: one to determine the moisture content of the grain, and the second to determine the mass of 1000 grains. This size is 5000g for corn, beans, nutritious legumes, 2000g for peas, chickpeas, 1000g for lentils and beans, wheat, millet, barley, oats, buckwheat, rice. It is 50g for white oats, vetiver, small-seeded lentils and 25g for millet. Measurements with a mass of up to 200 g are measured to the tenth of a gram, and measurements of more than 200 g are measured with an accuracy of 1 g. Measure moisture and 1000 g rains mass To determine the mass, pollutant and grain mixtures are separated. The first measurement is used to determine the moisture content. Two measurements are taken to determine the mass of 1000 grains. The analysis is carried out separately for each measure. The mixture is thoroughly mixed and spread to form a square layer. The square is divided into four parts (triangles) along two diagonals. For large-seeded crops, from each triangle (when the measurement is 100 g or more), 125 grains of the remaining crops are randomly selected. and for 250 seeds are counted. Grain seeds obtained from two opposite triangles are added. As a result, two measurements are made: for large-seeded crops - from 250 grains each and for other types of crops - from 500 grains each. Pairs of oat grains are separated from each other and counted



as two grains. The resulting four measurements are also measured on a technical scale with an accuracy of one-hundredth of a gram. Two measurements of large- and small-seeded grains if the difference between them is not more than 5% compared to their average mass, the event is considered correctly performed; if the difference is large, it is necessary to repeat the analysis from the beginning. The yield of flour is 3-5% higher in the large fraction weighing more than 40 g per 1,000 grains, compared to the small fraction weighing less than 23 g per 1,000 grains. Volumetric weight of grain is the weight expressed in grams of 1 liter of grain. The greater the volume weight of the grain, the better it is developed, the larger it is. Volumetric weight depends on grain shape, moisture, size, contamination and type of impurities. Experiments show that the volumetric weight of grain cleaned of impurities has a positive effect on the yield of flour. If the density is less than 740 g/liter, the output of flour decreases by 1% for every 17 g/l or even 13 g/l decrease in density. Its effect is less when the bulk density is higher than 740 g/l, and the quality of the flour deteriorates when the bulk density decreases. As a result of the decrease in the mass of 1000 grains, the specific surface of the grain layer increases. It is known that the process of heat exchange with the environment in a small grain develops faster than in a large grain. The strength of grain and other materials determines, on the one hand, whether they maintain their integrity during transportation along transport systems or during processing in various machines, and on the other hand, energy consumption during threshing or husking and peeling processes. Durability depends on the type of deformation: compressing (crushing) crushing of material consumes 2...2.5 times more energy than shearing deformation. Moisture is an important indicator for grain. When the humidity exceeds 15...17%, grain plasticity increases, which leads to an increase in energy consumption during threshing. Fine grain will have high durability. For example, the strength of the large fraction of durum wheat is 7.5...8.5 MPa, and that of the small fraction is in the range of 9.5-11.5 MPa. The strength of the anatomical parts of the grain is 27...33 MPa, the strength of the core is quite different. This factor is of important technological importance and facilitates the separation during selective crushing or shelling. Generally, the strength of the core of cereal crops is higher than the strength of the flower husks. The strength of millet grain is equal to 2.4 MPa, and the grain strength is equal to 2.9 MPa, for oats - 1.2 MPa and 1.8 MPa, for buckwheat - 1.9 MPa and 2.5 MPa. This indicator is used for wheat in most cases as one of the structural-mechanical properties of grain. It is related to the structure and strength of the core. Durum spring durum wheat was adopted as a standard of hardness. Hardness assessment is done in different ways. There is the most accepted and convenient method in use, which is based on the granulometric composition of flour: in this case, either the relative amount of the outer surface of the unit mass of flour, or the conditional average diameter of the flour particles, or the amount of particles of a certain size in the flour content - the particle size index (DI) is used; various tools - twerdometers are also used to evaluate this indicator. As grain hardness increases, kernel hardness increases, particle size index (BDI) and specific surface area of flour decrease, particle size and their size increase. This is reflected in the technological properties of grain. When the flour is pressed from durum wheat, a bread-like flour is obtained, it is well sifted in sieves, and the pieces of flour are close to the cube shape. On the contrary, when flour is sifted from soft grain wheat, irregularly shaped pieces are obtained, the flour consists of small parts



of the kernel and even free starch granules, the pieces of flour stick together, and it also makes it difficult to separate the flour from the sieves and makes it difficult for the product to pass through the sieve. Bran from durum wheat contains less starch. Such flour has high baking properties. The specific surface area of the flour obtained from hard grain is not more than 2600 cm²/g, the average particle index is 22 μm and 13 μm, (BOI) is 19% and 38%. The importance of the grain hardness indicator is that this feature is considered a variety sign and is passed from genetic generation to generation. Hard and soft graininess does not depend on transparency, largeness and other grain characteristics.

RESULTS: The mass of 1000 grains is found by summing two measured masses of 500 grains or by multiplying the sum of two measured masses of 250 grains by 2. The mass of 1000 grains is calculated by the following formula for the amount of dry matter:

$$m = mx(100-w)/100 \quad (1).$$

Here mx is the mass of 1000 grains of real moisture, w is the grain moisture (in %). As a result of our attempts to check the mass of 100 grains in laboratory conditions, we took the grains from 4 parts of 200 g using an electronic scale. We divided the obtained sample into 4 parts and counted 250 of them in parallel. We weighed them all together using an electronic scale. $M = 40.50$ g. We determined the mass of 1000 grains of the resulting sample using the above formula.

$$Mk = 40.50(100-14)/100; mk = 34.83 \text{ g.}$$

The results of the experiment showed that the mass of 1000 grains of our grain is 34.83 g. This indicator corresponds to barley grain. That is, the mass of 1000 grains in a barley plant is equal to $m = 20-55$.

Conclusion: Depending on the mass of 1000 grains of grain products, it represents their quality level, size, density and other important signs. The higher the mass of 1000 grains of grain, the higher the content of nutrients in grain. This feature of grain is also dependent on the endosperm part of the grain. Because the more the endosperm part of the grain, the higher the quality of the grain, which has a significant effect on the index of 1000 grains.

References:

1. Flour and semolina technology Tursunkhojiyev, N. Aykhojiyev, K. Tashkent - 2012
2. Grain cleaning and grinding technology. P.T. Adizov, A.Kh. Gaffarov Tashkent "Toronto Iqbal" - 2006
3. Oripov R., Khalilov N. Plant science. Tashkent, 2006.-B.168-170.
4. Khodjakulov T. and others. Importance of quality barley in the national economy. Agrosience. - Uzbekistan.
5. Amanov O.A., Sarmanov, Sh.Sh. Importance of barley in the national economy. //Rural Uzbekistan
6. Vasiev M.G., Dadaev Q.O., Isaboev I.B., Sapaeva Z.Sh., Gulomova Ya.J. Food technology
7. Musaev M.S. Effect of seed fractions and feeding on yield of Kyzilkurgan variety of barley pokazateley kachestva zerna yachmenya and different ecological conditions in Irkutsk region.
8. IV Pishchevaya technology, No. 2-3, 2011