

## SURFACE TREATMENT OF WHEAT GRAIN

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***Abstract.** Grain quality can be defined as a set of indicators and signs that significantly affect the possibility of using raw materials for processing for the purpose of manufacturing products for human or animal consumption. One of the many indicators of grain quality for processing processes is: the color and smell of grain, which are characteristic of high-quality unspoiled grain during its storage. Transportation, storage in harmful conditions, grain processing change its structure, natural properties, which is accompanied by a change in indicators. The appearance of a smell that is not typical for healthy grain is explained by the sorption of chemicals from the environment, the activity of microorganisms, which is the cause of changes in sensory quality indicators. Therefore, the use of chemical, mechanical and physical means of grain processing that prevent its spoilage is an urgent task.*

***Key words:** index, grain, smell, quality, ozone.*

**Introduction.** Grain obtained as a result of economic activity and directed to processing or storage is evaluated by physical, chemical and organoleptic indicators. Each type of grain has its own culture-specific smells. Healthy grain has a weak, weak smell, in contrast to ethereal, oleaginous crops, which have an intense smell. The change from the natural smell is due to the sorption of the grain. Normative documents provide that in the event of the appearance of a malty or moldy smell, such grain is subject to mandatory processing, if it is intended to be used for the manufacture of food products[1,2]. Grain that has a musty smell can be used as a fodder base for animals or in technical industries. The appearance of a putrid smell implies the use of grain only in a technical direction. One of the priority indicators of grain condition is color, smell,

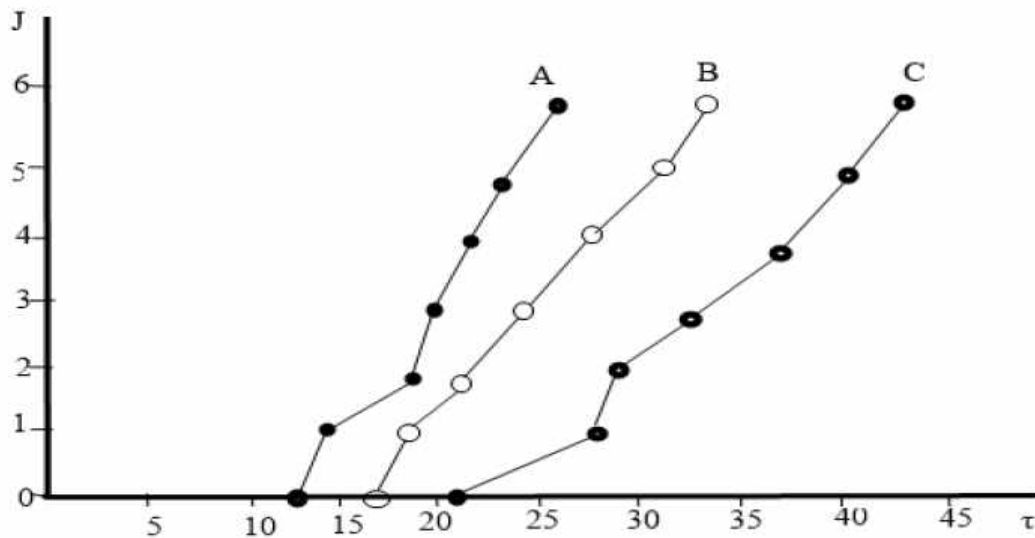
humidity, contamination by pests, the content of impurities, etc. These and other indicators are a very important factor that is taken into account to determine the direction of processing. With the help of sensory testing, a conclusion is made about the state of the grain based on the listed characteristics, and the possibility of making products from grain, for food or fodder purposes. To improve the condition of grains, various methods of maintaining raw materials in a high-quality condition are used. Accepted traditional forms of processing involve physical, chemical, and radiation measures that can be dangerous for the environment, so the use of methods that involve methods of processing based on natural components are now becoming especially relevant [2,3]. Thus, the application of processing based on the use of UV radiation can be one of such directions of raw material processing.

**Research materials and methods.** Wheat grain with 13% - 14% moisture was chosen for the purpose of research [4]. The study of failure during the lunar period with a relative humidity of 78% and a temperature of 18°C. It is known that due to the adsorption of wheat from the environment, the moisture content changes from 13% to 14% during the technological process and increases to the level of 16%. An increase in humidity promotes the activation of microorganisms, as a result of which there is a smell that indicates the development of mold. From the selected sample for analysis, the weight was passed through a sieve with a diameter of  $\text{Ø } 6 \text{ mm}$  for sensory evaluation. The obtained samples were placed in a closed jar until the samples reached a temperature of 18°C. The change in smell was determined both as a whole and in the ground state. Using the category and level of odor intensity J, the condition of the sample and the changes that occurred were evaluated.

**Research results.** In order to compare the obtained samples, the grains were treated with UV radiation for 3 min. and 5 min. After that, an analysis of changes in quality indicators was carried out. The results of the obtained data show that the most appropriate is grain processing at air humidity of 78% with an exposure of 5 minutes *Fig. 1.*

**Conclusions.** The feasibility of using additional processing is confirmed by research. From the obtained data, which are displayed on the graph, the resistance of the studied raw materials to changes in quality indicators, before and after treatment with UV rays and ozone, can be seen. In order to eliminate the negative effect of the influence of dangerous factors, it is advisable to carry out additional treatment with UV

rays and ozone in the technological process of grain processing along with existing operations.



**Fig. 1.** Graphical dependence of the change in quality indicator. A- The raw material is not processed; B - processed raw materials (duration of exposure  $t$ , 3 min); C - processed raw material (duration of exposure  $t$ , 5 min);

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