

# Russian scientists use ultrasound to increase grain harvest

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Credit: South Ural State University

Scientists of the South Ural State University have created and patented a method of processing grain that will balance the amino acid composition, increase the amount of synthesized vitamins and minerals

in its structure, and also ensure a high yield of wheat. The proposed approach to changing the properties of plant materials is effective and safe.

"Today in the grain industry, there are two problems: low quality of grain and shelf life. Our goal is to find new ways to process low-quality grain crops and get [healthy food](#)—innovative products with added nutritional benefits. In our research, we use the influence of ultrasound to intensify the process of [germination](#) of crops. The research is aimed primarily at germinating soft wheat [grains](#), which can be used in the baking industry, as well as a [food additive](#) or as a separate food ingredient," says Natalia Naumenko, candidate of Technical Sciences, associate professor of [food](#) and biotechnology at the Higher Medical and Biological School of SUSU.

Ultrasonic treatment affects the shell of a grain crop, which contributes to a more rapid penetration of moisture into its growth points (endosperm and germ). As a result, intensification of the germination process occurs. So if the duration of traditional methods of germination is about 24 to 26 hours, then the ultrasonic method of exposure can reduce it to 16 hours.

When processing grain, scientists use optimal exposure modes, which can intensify the process of germination as much as possible without causing any changes in the structural components of grain.

In 2018, scientists carried out the processing of seed material of wheat grain for cultivation in the sowing territories of the Chelyabinsk region. It is important to note that the experimental sites were located on crisis land plots that were not prepared for sowing grain crops. Nevertheless, good germination and quality of the crop were noted. The grain had a fairly high amount of protein and good quality of gluten. In addition, as a result of ultrasonic exposure, the height of the ear of wheat decreases,

which contributes to a longer ripening of the grain in the field. Thus, the new method of grain processing increases [wheat](#) productivity and improves quality.

In the future, scientists plan to develop a method of disinfecting grain. This process is necessary for the germination of [crops](#), since the fundamental principle of obtaining healthy foods is their safety.

Provided by South Ural State University

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