The results of experimental studies on the use of ultrasonic treatment for the effective conduct of the process of milk homogenization are proposed. The authors studied the influence of ultrasonic treatment on the process effectiveness. Regression dependences correlate with the experimental data with a correlation coefficient $k = 0.95...0.99$, which indicates a unique functional relationship between the variables under research.

Mathematical dependences allow to evaluate effectiveness of the process of ultrasonic milk homogenization at frequencies of 15, 22, 35 kHz, and to characterize the resulting product as a micro-heterogeneous.

According to the research, it is found that at the frequency 35 kHz, unsatisfactory results are obtained as compared with the frequencies 15 and 22 kHz. Thus, at frequency of 22 kHz in the range of fat globules’ sizes to 3 microns, the obtained results were 18...20% higher than at 35 kHz under the same conditions. However, an important factor is that the frequency of 15 kHz is the upper limit frequency of oscillation, which a human ear is able to feel, so their use in food plants is improbable.

During the experiments, it was found that treatment of milk with 3.2% fat content by ultrasonic waves of 22 kHz frequency, allows to achieve greater fineness ratio within 27...64%.

At the next stages of research, it is planned to determine the influence of ultrasonic treatment on the change of microbiological indicators.

The results of the research will contribute to the formulation of basic technological, operational and environmental requirements for effective homogenization of milk, and to the proposal of the conceptual design of hardware for the appropriate process.

**Keywords:** ultrasound, homogenization, milk, frequency, size, dispersed phase.