

Abstract

Humans observed long ago, that certain sounds have effects on living nature. This is the same in case of the ultrasound. In the 1950s researches have begun, that represented, that those cell cultures, which have been treated with ultrasound, behaved differently than those not treated. This was the beginning of a long line of researches that are still running. How can we produce fermented foods and other consumable goods faster in the same quality? This study plans and develops though a machine, which can help the researchers in this field.

In this study, at first I reviewed the basic questions surrounding this topic, the literature of the physical background. I specifically overviewed the production and measurement of ultrasound. I also overlooked the basics of fermentation. Next, I examined I provided plans for developing this system. In this process, I specified the equipment, made the choice among suitable hardwares and solutions. Regarding, that the full production of this device is limited by this study, only a prototype was brought to life. This means, that I only realized functions really needed, leaving those less important. I thoroughly explained the selection of functions and the planning process. The finally ready device was taken under serious inspection. After this, connecting an ultrasonic transducer, I measured functional features and the characteristic of the transducer in open air and in water. For this measurement, I made a hydrophone. The measurement turned out as expected, the bigger propagation velocity in fluids broadened the characteristic.

In the study, a device was planned and constructed, which is able to drive ultrasonic transducers. Besides this, it features current measurement, visual feedback and connectors for sensors. The device presented here was shown to be effective and working, and it can be a possible good basis sonoporation equipment.