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The effectiveness of using ultrasound in strawberry juice production.

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Abstract

Berry fruits have great health-promoting potential due primarily to their high content of phenolic compounds. The extraction of anthocyanin pigments into juices and the use of proper processing technology are key elements, in addition to the quality of the raw material. The use of ultrasound in food processing belongs to the so-called non-thermal technologies. This method is based on the vibration of particles at frequencies above the threshold of human hearing (>16 kHz) caused by sound waves. The aim of the study was to determine the effect of the application of ultrasound at the stage of processing raw material or treating strawberry juice on its quality. In the case of raw material processing, the aim of the treatment was to improve the juice pressing efficiency and increase the extraction of phenolic compounds. The juice obtained was compared with the product pressed by enzymatic maceration, and with two control objects: treated only with 55°C temperature, and juice pressed at 20°C. The use of ultrasound increased juice pressing efficiency by 50% compared to the 55 °C control and by 67% compared to the 20 °C control. The pressing yield of juice obtained after ultrasonic treatment was not statistically significantly different from juice obtained by enzymatic maceration. In the case of ultrasonic treatment of juice, the aim of the treatment was to increase turbidity while maintaining the health-promoting value of the product.

In the case of ultrasonic treatment of juice, the aim of the procedure was to increase turbidity while maintaining the health-promoting value of the product. The applied method of ultrasonic homogenization conducted for 2 or 8 minutes was compared to high-pressure homogenization using either 200 or 600 bar pressure. The effectiveness of homogenization was evaluated based on the effect of the treatments on the particle size of the pulp in the juice compared to non-homogenized juice. Ultrasonic treatment increased the proportion of particle sizes below 25 µm by 45%. Ultrasonic homogenization conducted for 8 minutes most effectively increased juice turbidity. Regardless of the type of homogenization used, no reduction in total anthocyanin and ascorbic acid content was observed.

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