

## Changes on Some Physical and Chemical Properties of Red Beetroot Juice during Ultrasound Pretreatment

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**Abstract :** Ultrasound is defined as sound waves having frequencies higher than 20 kHz, which is greater than the limits of the human hearing range. In recent years, ultrasonic treatment is an emerging technology being used increasingly in the food industry. It is applied as an alternative technique for different purposes such as microbial and enzyme inactivation, extraction, drying, filtration, crystallization, degas, cutting etc. Red beetroot (*Beta vulgaris L.*) is a root vegetable which is rich in mineral components, folic acid, dietary fiber, anthocyanin pigments. In this study, the application of low frequency high intensity ultrasound to the red beetroot slices and red beetroot juice for different treatment times (0, 5, 10, 15, 20 min) was investigated. Ultrasonicated red beetroot slices were also squeezed immediately. Changes on colour, betanin, pH and titratable acidity properties of red beetroot juices (the ultrasonicated juice (UJ) and the juice from ultrasonicated slices (JUS)) were determined. Although there was no significant difference statistically in the changes of color value of JUS samples due to ultrasound application ( $p>0.05$ ), the color properties of UJ samples ultrasonicated for low durations were statistically different from raw material ( $p<0.05$ ). The difference between color values of UJ and raw material disappeared ( $p>0.05$ ) as the ultrasonication duration increased. The application of ultrasound to red beet root slices adversely affected and decreased the betanin content of JUS samples. On the other hand, the betanin content of UJ samples increased as the ultrasonication duration increased. Ultrasound treatment did not affect pH and titratable acidity of red beetroot juices statistically ( $p>0.05$ ). The results suggest that ultrasound technology is the simple and economical technique which may successfully be employed for the processing of red beetroot juice with improved color and betanin quality. However, further investigation is still needed to confirm this.

**Keywords :** red beetroot, ultrasound, color, betanin

**Conference Title :** ICBFE 2014 : International Conference on Biotechnology and Food Engineering

**Conference Location :** Rome, Italy

**Conference Dates :** September 18-19, 2014