

NON-THERMAL TECHNOLOGIES - PULSED ELECTRIC FIELD AND HIGH-POWER ULTRASOUND AFFECTS THE ANTHOCYANIN CONTENT IN STRAWBERRY JUICE

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Color is the most important quality characteristic which consumers perceive first in fruit products, as those made of strawberries, especially for juice. Anthocyanins, the antioxidant compounds responsible for appealing red color of strawberries, have unstable chemical structure that decomposes very quickly at elevated temperatures under the conventional preservation methods. Since strawberries are highly perishable fruits and degrade their color easily, a recent study found that processing strawberries with lower ripeness can result in higher quality products with better preservation of anthocyanins. Therefore, the aim of this work was to investigate the influence of non-thermal technologies such as pulsed electric field (PEF) and high-power ultrasound (HPU) on the stability of color, i.e., anthocyanins in strawberry juices. Samples were prepared from fruits of different ripeness levels (75% vs. 100%), and stored for 7 days at 4 °C. The PEF treatment was performed under the following operating conditions: electric field strength (40 and 50 kV), frequency (100 and 200 Hz), pulse duration (0.5 µs), and treatment time (3 and 6 min). The HPU treatment was done under the following conditions: amplitude (25, 50, 75 and 100%), pulse (50 and 100%) and treatment time (5 and 10 min). For fresh juice samples (control samples) and PEF and HPU-treated juices, ripeness and storage had a statistically significant effect on anthocyanin content. Electric field strength and frequency influenced anthocyanins in PEF-samples, while treatment time had no effect. In contrast to PEF, all parameters of HPU treatment (amplitude, pulses and treatment time) had a statistically significant effect on anthocyanin content in juices. Comparing the fresh juice (controls) with the treated juices, a 6.60% increase in anthocyanins was observed for PEF-samples, while the opposite trend was observed for the HPU, i.e., a 10.75% decrease in anthocyanins. In conclusion, strawberries of both ripening stages are suitable for the production of functional juices by non-thermal technologies. The PEF showed a better protective effect in terms of anthocyanins preservation than HPU technology did, hence adjustment of HPU parameters is necessary to explore potential industrial applications.