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Effect of pulsed electric field (PEF) treatment on sugarcane juice

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Abstract

This study was carried out to evaluate the effect of PEF process using static treatment chamber on fresh sugarcane juice with and without addition of lemon and ginger with respect to microbial content, chemical properties, nutrient content and shelf life extention of the product. The fresh sugar cane juice without addition of lemon and ginger treated at different field strengths (30 kV cm^{-1} and 50 kV cm^{-1}) and different pulse numbers (150, 300) was initially investigated by storage at room temperature (31 °C) and refrigeration temperature (4 °C) for 30 days. The PEF effect on fresh sugar cane juice at room temperature and refrigerated temperature was compared with untreated sample (31 °C). At the end of the storage period samples treated at field strength 30 kV cm^{-1}, 150 pulses were found to be stable compared with untreated sample. The second experimental study of PEF process was done on fresh sugarcane juice with the addition of lemon and ginger for fourteen days at different electric field intensities (10 kV cm^{-1}, 20 kV cm^{-1} and 30 kV cm^{-1}) with the same pulse number (150 pulses) and stored 4 °C. Even better reduction of microbes was achieved with PEF treatment condition of field strength 20 kV cm^{-1}, 150 pulses in the presence of lemon and ginger. The sensory attributes of untreated fresh sugarcane juice were maintained up to only two days, but for the PEF

treated sample, shelf life was extened up to seven days. Further, addition of lemon and ginger in the PEF treated sugarcane juice doubled the shelf life up to fourteen days.

Keywords

Electric field intensity; Pulse number; Static treatment chamber; Microbial growth reduction; Shelf life;