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IMPACT OF BLOCK CRYOCONCENTRATION ON POLYPHENOL RETENTION IN BLUEBERRY JUICE

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ABSTRACT

Cryoconcentration technology produces high-quality concentrates that retain valuable components found in fruit juices, such as polyphenols. The aim of this study was to evaluate the effect of centrifugation-assisted block freeze concentration under different freezing conditions on polyphenol retention and physicochemical properties of cryoconcentrated blueberry juice. As the cryoconcentration cycles progressed, the total polyphenol and monomer contents increased significantly, which was reflected in the high retention percentage (over 70%). The color evaluation showed that the final concentrate was darker than the initial sample (decreased L^* and $\Delta E^* > 12$). Based on the process parameters, -20°C /unidirectional was the best freezing condition in terms of efficiency (60%), percentage of concentrate (71%) and solute yield (0.78 kg solute/kg initial). Therefore, centrifugal cryoconcentration of blueberry juice was effective in obtaining a cryoconcentrate with high retention of polyphenol monomers, as well as notable values in terms of solutes, color and process parameters.

Keywords: Cryoconcentration, centrifugation, blueberry juice, solutes, polyphenol monomers, process parameters

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