

**Pengaruh Jarak High Pulsed Electric Field terhadap Yield Ekstraksi Gula
Buah Bit (*Beta vulgaris L.*)**
(*The Effect of Distance High Pulsed Electric Field on the Sugar Extraction Yield
of Red Beetroot (*Beta vulgaris L.*)*)
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ABSTRACT

Red beetroot (*Beta Vulgaris L.*) is a food crop containing natural sugars, including sucrose, glucose, and fructose, making it a potential raw material for sugar extraction. However, the efficiency of conventional sugar extraction remains relatively limited due to the low permeability of plant cell membranes. High Pulsed Electric Field (HPEF) is a non-thermal technology that works through an electroporation mechanism to increase cell membrane permeability, thereby enhancing the release of intracellular compounds, particularly sugars. This study aimed to analyze the effect of HPEF treatment with different electrode distances on total soluble solids, soluble solids yield as an indicator of extraction yield, and non-reducing sugar (sucrose) content in red beetroot. The study employed a Completely Randomized Design (CRD) with one factor consisting of three treatments: control (P0), HPEF with an electrode distance of 0,5 cm (P1), and HPEF with an electrode distance of 1,5 cm (P2). Each treatment was performed in triplicate, resulting in a total of 9 experimental units. HPEF treatment was applied at 15 kV, frequency 1 Hz, and 250 pulses, followed by extraction at 45°C for 120 minutes with a stirring speed of 250 rpm. The data were analyzed using One-Way ANOVA, followed by Tukey's test at a 5% significance level. The results showed that HPEF treatment with different electrode distances had a significant effect on total soluble solids, soluble solids yield, and sucrose content. The treatment with a 0,5 cm electrode distance (P1) produced the highest values for all observed parameters. Overall, the application of HPEF as a pretreatment improved the efficiency of sugar extraction from red beet root.

Keywords: red beetroot, HPEF, sugar extraction, extraction yield, sucrose