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Effect of needle number on drying rate of kiwi fruit in EHD drying process

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ABSTRACT
Electrohydrodynamic (EHD) drying is a novel method of non-thermal processing. In this drying method, drying can be carried out using either AC or DC high voltages. The thermodynamic considerations regarding the lowering of temperature under EHD drying include rapid rates of evaporation and exothermic interaction of the electric field with a dielectric material. Multi-point and plate electrode systems are efficient in accelerating drying of agricultural materials. The electrode produces corona wind, which resembles a round jet, impinges and removes moisture from the surface. The enhancement of drying rate by corona discharge from needle electrodes has been experimentally evaluated in this study. Effects of three different categories, one needle, nine needles and seventeen needles on drying rate of kiwi fruit were studied, moreover in each category, Experiments were carried out using DC voltage levels of 6, 10.5 and 15 kV and field intensities 4.5 kV/cm. Results showed that the effect of needle number on drying rate was significant and drying rate of kiwi fruit reduced with increasing in needle numbers.

KEYWORDS
Drying Rate; Electrode; Field Strength; High Voltage; Needle Number

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