Effect of pulsed electric field treatment on drying rate and quality changes of spinach in hot air drying

*Koya Yamakage¹, Takahiro Yamada¹, Takahiro Orikasa²,³, Katsuyuki Takahashi²,⁴, Shoji Koide³, Koichi Takaki²,⁴, Hitoshi Aoki⁵, Junichi Kamagata⁵ (1. Graduate School of Arts and Science, Iwate University(Japan), 2. Agri-Innovation Center, Iwate University(Japan), 3. Faculty of Agriculture, Iwate University(Japan), 4. Faculty of Science and Engineering, Iwate University(Japan), 5. Nichirei Foods Inc.(Japan))

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Although hot air drying is a commonly method for vegetable preservation, it has various disadvantages, including a slow drying rate. To increase the drying rate, hot water (HW) pretreatment is often applied during dried vegetable production using hot air. However, HW pretreatment can result in the elution of water-soluble components. Therefore, we examined the application of pulsed electric field (PEF) technology before drying as a waterless treatment to overcome the disadvantages of HW pretreatment. We measured the moisture content and quality changes in spinach (residual ratios of L-ascorbic acid (L-AsA) and potassium (K)) after drying with PEF, HW and control (CONT) treatments. The drying rates were faster for PEF and HW than for CONT. The residual ratios of L-AsA and K were higher for PEF than for HW. Our results indicated that PEF was more effective than HW as a pretreatment method before drying with respect to the drying rate and the maintenance of water-soluble components. This pretreatment approach has potentially applications for the productions of high-quality dried vegetables.