

Electrical and mechanical analysis to evaluate the cultivar difference in strawberries with respect to their bruising sensitivities and mass loss acceleration

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Abstract

This study investigated the differences in the bruising characteristics of three strawberry cultivars that were subjected to mechanical compression, while elucidating the effect of bruising on the acceleration of mass loss during storage; these investigations were aimed at achieving long-term transportation. The length of the coordinate at the top of the circular arc of Cole-Cole plots from the origin (LTO) was obtained using electrical impedance techniques and was employed as an indicator of the degree of bruising. The LTO values of the control samples were approximately 30,000 Ω ; however, they decreased with the increasing compression strain, so the strain was evaluated to be the primary factor for their bruising. Further, a disparity was observed in different cultivars with regard to their fragilities to compression. Mass loss of samples during storage was approximately 0.01 – 0.03 (-); however, owing to an increase in the degree of bruising, the mass loss for each cultivar was accelerated during storage; moreover, there are significant differences among the cultivars. These findings demonstrate that selecting an appropriate cultivar alleviates bruising and deterioration during transportation. Moreover, the combination analysis using electrical analysis and measurement of quality decline rate may be advantageous for the selection of good cultivars.