

Backscattering imaging as a monitoring system for moisture content and colour changes in pumpkin during drying process

ABSTRACT

In this study, the potential of backscattering imaging system for monitoring moisture content (MC) and colour changes in pumpkins during drying was investigated. Peeled pumpkin slices with 0.4cm thickness were oven dried at temperatures 60°C, 70°C and 80°C. The MC and colour changes were monitored using backscattering imaging at different time interval. ANOVA results revealed that all backscattering imaging parameters were significantly affected by both drying temperature and time at $p < 0.05$. The prediction model based on backscattering imaging parameters resulted in high R^2 and low RMSEP values for moisture content, lightness (L^*), redness (a^*) and yellowness (b^*) predictions at 60 °C, with $R^2 > 0.7$ and $RMSEP < 1.8$. The backscattering imaging parameters also resulted in good prediction of MC, L^* and b^* for pumpkin during drying with $R^2 > 0.8$ and $RMSEP < 2.2$ at 70 °C, and $R^2 > 0.6$ and $RMSEP < 3.1$ at 80 °C, respectively. The findings of this study show that backscattering imaging system has a great potential for monitoring quality changes of pumpkin during drying.

Keyword: Drying; Backscattering imaging system; PLS; Pumpkin; Quality assessment