

Color change kinetics and total carotenoid content of pumpkin as affected by drying temperature

ABSTRACT

The color changes kinetics of pumpkin slices during convective hot air drying was investigated at drying temperatures of 50, 60, 70 and 80 °C. The hunter lab L*, a* and b* color coordinates were used as assessment indicators. The total color change, chroma value, hue angle and brownness index (BI) of the pumpkin slices were also determined. To determine the most suitable kinetics model for the prediction of the color changes of pumpkin, the zero-order, first-order, and fractional conversion models were fitted to the experimental data, using linear regression analysis. The activation energy of the color change parameters (L*, a*, b* and BI) was estimated and found to be 41.59 kJ/mol, 16.287 kJ/mol, 63.856 kJ/mol and 73.390 kJ/mol respectively. The fresh pumpkin samples contained a mean total carotenoid content of 25 µg/g, while the total carotenoid content of samples dried at 50 °C, 60 °C, 70 °C and 80 °C were 146 µg/g, 56.4 µg/g, 37.9 µg/g and 102.5 µg/g respectively. Further, the results of ANOVA showed there was significant difference between the total carotenoid content of the fresh pumpkin samples and those dried in convective hot air dryer at 5% (p<0.05) significant level.

Keyword: Thin layer drying; Color kinetics; Color measurement; Carotenoid; Pumpkin