IMPACTS OF GREEN TEA EXTRACT FORTIFICATION ON THE STALING CHARACTERISTICS OF STEAMED BREAD DURING STORAGE

Joleyn L. Lee, Victoria K. Ananingsih, Weibiao Zhou*

Food Science and Technology Programme, c/o Department of Chemistry, National University of Singapore, 3 Science Drive 3, Singapore 117543

* Corresponding author: Telephone: +65 6516 3501; Email: chmzwb@nus.edu.sg

Steamed bread can be fortified with green tea extract (GTE), not only to increase the nutritional value of the bread but also for the GTE acting possibly as a functional ingredient to delay the staling of the bread during storage. This study focused on the effect of GTE on the staling characteristics of steamed bread during storage. The staling characteristics were demonstrated by the changing profiles of hardness and retrogradation (i.e. enthalpy of starch crystallisation) during storage of steamed bread for one day at room temperature and one week at refrigeration temperature. GTE was added to steamed bread dough at 0% (control), 0.25%, 0.5% and 0.75% flour mass, respectively. Texture profile analysis showed that increasing GTE up to 0.5% did not affect the hardness of fresh steamed bread. The specific volume of steamed bread was only affected by the GTE addition at 0.75%. Spectrophotometric measurements showed that the steamed bread became darker and redder with increasing GTE. After storage at room temperature for one day, re-steamed and non-steamed samples all became harder, but showed the same trend as the fresh ones in terms of the effect of GTE. Differential scanning calorimeter (DSC) measurements showed similar values of enthalpy of starch crystallisation in un-steamed samples at all the 4 GTE concentrations. After one week storage at refrigeration temperature, re-steamed samples containing 0.25% and 0.5% GTE were softer than the control. DSC measurements showed a decreasing trend in the enthalpy of crystallisation as the GTE concentration increased.

Keywords: green tea extract; steamed bread; staling; hardness; retrogradation; catechins