

Effects of temperature and time on the physical characteristics of moist cakes baked in air fryer

ABSTRACT

Baking temperature and time are among the conditions for producing good quality cakes. The aim of this study was to investigate the effects of baking temperature and time on the volume expansion, moisture content, and texture of moist cakes baked in either an air fryer or a convection oven. The cakes were baked under different conditions: (1) baking temperature of 150 °C, 160 °C, and 170 °C for both air fryer and convection oven and (2) baking time of 25, 30, 35 min for air fryer and 35, 40, 45 min for convection oven. Baking temperature and time were found to have a significant ($p < 0.05$) effect on the relative height, moisture content, firmness and color of the product but no significant effect on the springiness of the product. Based on the numerical optimization method, the optimum condition in an air fryer was 150 °C for 25 min. These optimized conditions resulted in higher relative height (37.19%), higher moisture content (28.80%), lower crumb firmness and chewiness (5.05 N and 1.42 N respectively) as well as higher overall acceptance score (5.70) as compared to optimum condition in convection oven (150 °C at 55 min). Moreover, baking in the presence of rapid air flow in an air fryer may be declared that it is possible to produce high-quality moist cake with minimum baking temperature and shorter baking time.

Keyword: Air fryer; Convection oven; Baking parameters