

Antioxidant and ACE inhibitory peptides released from simulated in vitro gastrointestinal digestion of cooked chicken breast protein

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The effect of thermal treatments on the release of antioxidant peptides from chicken meat upon in vitro gastrointestinal digestion was investigated. Breast muscle of Korat crossbred chicken (KC) and commercial broiler (BR) was cooked under various conditions, namely heating at 70°C for 30 min (H-0.5) and 24 h (H-24), autoclaving at 121°C for 15 min (AC-15) and 60 min (AC-60). Protein digestibility of chicken breasts decreased under AC-60 treatments. The H-0.5 improved metal chelating activity of KC digesta, FRAP and anti-liposome oxidation of BR digesta. In addition, digesta of BR/H-0.5 and KC/AC-15 at 50 µg/ml exhibited the highest cytoprotective effect against tert-butyl hydroperoxide (TBHP)-induced oxidative damage of HepG2 cells. Moreover, KC/ H-0.5 showed the highest ACE inhibitory activity than did BR and then subjected to purification. Out of nine peptides identified by liquid chromatography-mass spectrometry, three peptides including KPLLCS, ELFTT, and KPLL whose sequences were homologous to those of myosin exhibited the strongest inhibitory activity with IC₅₀ of 2.57, 44.46, and 76.96 µM, respectively. This may have implication that consumption of chicken breast of CK and BR chicken may exert some health benefits.

Keywords: Chicken breast protein, antioxidant, ACE inhibitory, peptides and Gastrointestinal digestion