

Effects of storage time and temperature on lipid oxidation and protein co-oxidation of low-moisture shredded meat products

ABSTRACT

Studies on the oxidative changes in meat-based, low-moisture, ready to eat foods are complicated due to complex food system and slow lipid-protein oxidative deterioration. The current study evaluates the oxidative changes over six months of storage on shredded beef and chicken products (locally known as serunding) for physicochemical analysis, lipid oxidation (conjugated dienes and malondialdehydes) and protein co-oxidation (soluble protein content, amino acid composition, protein carbonyl, tryptophan loss and Schiff base fluorescence) at 25 °C, 40 °C and 60 °C. The lipid stability of chicken serunding was significantly lower than beef serunding, illustrated by higher conjugated dienes content and higher rate of malondialdehyde formation during storage. In terms of protein co-oxidation, chicken serunding with higher polyunsaturated fatty acids (PUFA) experienced more severe oxidation, as seen from lower protein solubility, higher protein carbonyl and Schiff base formation compared to beef serunding. To conclude, chicken serunding demonstrates lower lipid and protein stability and exhibits higher rate of lipid oxidation and protein co-oxidation than beef serunding. These findings provide insights on the progression of lipid oxidation and protein co-oxidation in cooked, shredded meat products and could be extrapolated to minimize possible adverse effects arising from lipid oxidation and protein co-oxidation, on the quality of low-moisture, high-lipid, high-protein foods.

Keyword: Lipid oxidation; Low moisture food; Protein co-oxidation; Ready-to-eat; Shredded meat; Serunding