# A comparative study of antioxidant properties and oxidative stability in beef rendang under prolonged heating and varying coconut milk percentages: a chemometric approach

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## Abstract

This study investigated the impact of varying coconut milk percentages (0–125%) and cooking times (0–4 h) on the antioxidant properties and oxidative stability of beef rendang, a traditional Southeast Asian dish. Antioxidant activity was assessed through total phenolic content (TPC), total flavonoid content (TFC), 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging assay, and Ferric

reducing antioxidant power (FRAP) assays, while lipid and protein oxidation were evaluated via conjugated dienes, anisidine values, carbonyl content, and soluble protein. Creatine and creatinine levels were also monitored. Results revealed that higher coconut milk concentrations (50–125%) and moderate cooking times (2–4 h) enhanced antioxidant activity and reduced lipid and protein oxidation. However, prolonged cooking diminished antioxidant properties due to increased oxidation reactions. Chemometric analysis highlighted significant interactions between coconut milk and cooking time. This study underscores the need to optimise coconut milk levels and cooking duration to improve the quality and safety of rendang, benefiting both manufacturers and consumers. 

## Indexed keywords

**Engineering uncontrolled terms**

Antioxidant activities; Antioxidant properties; Chemometric approach; Coconut milk; Comparatives studies; Cooking time; Lipid oxidation; Oxidative stability; Protein oxidation; Total phenolic content

**Engineering main heading**

Cooking

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