Use of lyophilised and powdered *Gentiana lutea* root in fresh beef patties stored under different atmospheres

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Abstract

BACKGROUND: ***Gentiana lutea*** **root is a medicinal herb that contains many active compounds which contribute to physiological effects, and it has recently attracted much attention as a natural source of antioxidants. The aim of this study was to evaluate the effects on the colour, pH, microbial activities, sensory quality and resistance to lipid oxidation (through the thiobarbituric acid method) during storage of beef patties containing different concentrations of** ***G. lutea*****. Fresh beef patties were formulated with 0–5 g kg^{-1} of** ***G. lutea*** **and 0 or 0.5 g kg^{-1} of ascorbic acid and packed in two different atmospheres, Modified Atmosphere 1 (MAP1) and Modified Atmosphere 2 (MAP2), and stored at 4 $\pm$ 1 °C for 10 days. MAP1 contained 20:80 (v/v) O_2:CO_2 and MAP2 contained 80:20 (v/v) O_2:CO_2.**

RESULTS: ***G. lutea*** **extracts possessed antioxidant activity measured by the ferric reducing antioxidant power and the oxygen radical absorbance capacity assays. Beef patties containing 2 g kg^{-1} of lyophilised** ***G. lutea*** **were stable towards lipid oxidation in both atmospheres ($P < 0.05$). Beef patties containing a combination of 2 g kg^{-1}** ***G. lutea*** **and 0.5 g kg^{-1} ascorbic acid showed significantly reduced changes in colour and in lipid oxidation ($P < 0.05$).**

CONCLUSION: The results from this study demonstrate the potential of ***G. lutea*** **as a food ingredient in the design of healthier meat commodities.**

Keywords: *Gentiana lutea*; lipid oxidation; modified atmosphere; antioxidant; beef patties