



## Oxidative Stability of Ground Lamb Enhanced with Extracts from Peel and Seed of Camu Camu (*Myrciaria Dubia*)

J. M. Guedes-Oliveira<sup>1</sup>, B. R. C. Costa-Lima<sup>1,2</sup>, L. C. M. Cunha<sup>1</sup>, A. P. A. A. Salim<sup>3</sup>, J. D. Baltar<sup>4</sup>, A. R. Fortunato<sup>3</sup>, and C. A. Conte-Junior<sup>1\*</sup>

<sup>1</sup>Departamento de Tecnologia de Alimentos, Universidade Federal Fluminense, Niterói, Brazil; <sup>2</sup>University of Kentucky, Lexington, KY, USA; <sup>3</sup>Universidade Federal do Rio de Janeiro, Brazil; <sup>4</sup>Universidade Unigranrio, Rio de Janeiro, Brazil

**Keywords:** fruits, natural antioxidants, plant extracts

Meat and Muscle Biology 1(2):155

doi:10.221751/rmc2016.148

### Objectives

Lamb meat exhibits chemical composition that favors lipid and protein oxidation processes affecting color, texture, eating quality, and nutritional value. Plant extracts are rich in phenolic compounds which are potential antioxidants. Peel and seeds contain increased levels of such phytochemicals. The objective of the present study was to evaluate the antioxidant potential of camu camu peel and seed extracts on the chemical stability of ground lamb.

### Materials and Methods

Extracts were obtained utilizing either water or 50% (v/v) ethanol in water solvents at a solute-to-solvent ratio of 1:10. Total phenolic content of the extracts was estimated by Folin-Ciocalteu method. Eight lambs *Longissimus dorsi* muscle cuts, 36 h *post mortem* and ground, enhanced to 110% of the initial weight with either water (negative control; NC); 100 ppm BHT (positive control; PC); 100 ppm peel extract (PE); or 100 ppm seed extract (SE), formed into 30 g patties, aerobically packed, and stored at 4°C for 9 d. Six batches were elaborated for each treatment totaling six replicates ( $N=6$ ). Instrumental color, lipid oxidation (TBARS), and protein oxidation (carbonyls) were evaluated on d 0, 5, and 9. Data were analyzed using ANOVA and Tukey test at 95% confidence level utilizing XLStat.

### Results

Camu camu extracts (PE and SE) affected ( $P < 0.05$ )  $L^*$  values of ground lamb on d 5 and 9. PE and SE patties exhibited lower lightness than NC and PC on d 5 while on d 9 only SE samples were darker (lower  $L^*$  value) than their counterparts. NC, PC, and SE patties exhibited an increase ( $P < 0.05$ ) on the  $L^*$  values during storage while on PE this parameter was not affected ( $P > 0.05$ ). NC and SE patties were more red ( $P < 0.05$ ;  $a^*$  value) than PC and PE on d 0 whereas, on d 9 PC exhibited the highest ( $P < 0.05$ ) values (8.06) than NC, PE and SE (7.15; 6.51; 6.71), respectively. Storage decreased ( $P < 0.05$ ) the  $a^*$  values in all treatments. Although on d 0 all patties exhibited similar ( $P > 0.05$ )  $b^*$  values, on d 5 and 9 PE and SE samples were lower ( $P < 0.05$ ) than NC and PC. Similar to  $a^*$  value, storage negatively affected ( $P < 0.05$ ) the  $b^*$  values. In terms of lipid oxidation, PE and SE patties exhibited lower ( $P < 0.05$ ) TBARS values than NC and PC during storage. In addition, although storage promoted increase ( $P < 0.05$ ) on TBARS values (Abs), in PE and SE patties the increase was less accentuated (0.060; 0.055) than in controls NC and PC (0.074; 0.075), respectively. PE and SE patties exhibited higher ( $P < 0.05$ ) carbonyls values (6.10; 6.04) nmol of carbonyl per mg of protein, than NC and PC (4.82; 3.70) nmol of carbonyl per mg of protein, during storage.

### Conclusion

Peel and seed extracts of camu camu are potentially sources of lipid antioxidants with limited stabilizing effect on ground lamb color and formation of protein carbonyls.