Effect of Dietary Supplementation on the Photoxidative Stability of Lipids from Beef meat, during storage under Commercial Retail Conditions

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The effects of feeding composition on the photoxidative stability of lipids from beef meat, were evaluated during storage under commercial retail conditions. Feeding was enriched with various ingredients (linseed oil, vitamin E, conjugated linoleic acid (CLA)) at various doses, leading to 7 independent diet groups: control (A), linseed oil/vitamin E for 180 days (B), linseed oil/vitamin E for 90 days (C), CLA /vitamin E for 180 days (D), CLA/vitamin E for 90 days (E), linseed oil/CLA/vitamin E for 180 days (F) and linseed oil/CLA for 180 days (G). Meat slices obtained from the different groups of animals, were packed in vessels with transparent shrink film (half of them were covered with aluminum foil- T8D-) and subjected to photo-oxidation with a white fluorescent light for 8 hour at 8°C (T8L). Peroxide value (POV) and thiobarbituric acid reactive substances (TBARs) were determined before and after photo-oxidation.

POV value ranged from 0.6 (control-T0) to 8.0 meqO_2/kg lipids (diet D-T8D), whereas TBARs varied from 0.3 (diet C-T0 and diet E-T0) to 3.2 mg malonaldehyde (MDA)/kg meat (diet C-T8D). In general, during storage at 8°C and darkness conditions, both oxidation parameters increased, while exposure to light led to hydroperoxide breakdown with a consequent increase of TBARs. Vitamin E increased the oxidative stability of beef meat subjected to photo-oxidation under commercial retail conditions, regardless of the other feed ingredients. Beef meat obtained with diets C and E was more stable from the oxidative standpoint, due to the enrichment with vitamin E and the shortest period of diet supplementation. On the other hand, diet G resulted in the highest oxidation level, because it contained a larger dose of CLA and linseed oil and it was supplied for a longer period (180 days).