

## Effect of Partial Oxygen Pressure and Vitamin E Spray on Metmyoglobin Formation on the Surface of Displayed beef

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To inhibit myoglobin oxidation and reduce metmyoglobin on the surface of displayed beef during storage, the effects of vitamin E spray or partial oxygen pressure ( $pO_2$ ) control on the surface of meat were investigated. At 24 hours post-mortem, *m. semimembranosus* muscle was dissected from the carcass and slices (2cm thick) were prepared. Beef cores (12cm<sup>2</sup>×2cm thick) were removed from the slices and placed onto trays. All samples including vitamin E sprayed samples were overwrapped with oxygen-permeable PVC film, and displayed at 4°C for 1, 3, 5, 7 and 14 days. For controlled  $pO_2$  samples, after each storage days, slices were vacuum packed for 1 hr and then sealed in atmosphere of 100% oxygen for another 1 hr. These samples were used to measure Color (Minolta L\*, a\*, b\*), chemical state of myoglobin (total and surface of samples) and lipid oxidation (TBARS).

TBARS values of vitamin E treated samples were significantly ( $p<0.05$ ) lower than those of control and  $pO_2$  samples after 5 days storage. However, there were no significant ( $p>0.05$ ) differences in TBARS values between control and  $pO_2$  samples. Also Minolta a\* value of vitamin E samples were significantly ( $p<0.05$ ) higher than others after 5 days storage. After 7 days of storage,  $pO_2$  samples showed higher Minolta a\* values compared to control. Metmyoglobin % on the surface of vitamin E treated samples were significantly ( $p<0.05$ ) lower after 5 days of storage. However, oxymyoglobin % of  $pO_2$  samples were significantly ( $p<0.05$ ) higher than control after 7 days storage. Results suggested that metmyoglobin formation on the surface of displayed beef could be inhibited by spray of vitamin E, and some of metmyoglobin could be reduced by control of  $pO_2$ .