

The Effects of Conjugated Linoleic Acid on Oxidation of Lipid and Myoglobin in Meat During Cold Storage

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Conjugated linoleic acid (CLA) is a mix of geometric and positional isomers of cis 9, trans 12 linoleic acid, with the major isomers being cis 9, trans 11 and trans 10, cis 12. Animal fed CLA have been reported to have reduced weight loss, improved growth and increased lean body mass. In this study, we have hypothesized that CLA prohibits myoglobin oxidation due to delay lipid oxidation, so that meat color could be improved during cold storage. Two trials were conducted to investigate the relationship between CLA and myoglobin oxidation.

For the first trial, a total of 48 pigs were fed a diet including 5% CLA for 4 weeks before slaughter, and meat color (CIE L*, a*, b*) and lipid oxidation (TBARS; thiobarbituric acid reactive substances) were measured during 28 days of cold storage at 4°C. The simple correlation coefficients between CLA and a* value and TBARS were -0.283 (p=0.180) and -0.803 (p<0.0001) respectively. This result suggested that CLA could effect the lipid oxidation, but had only a small effect on meat color.

For the second trial, we made beef patties including 0.5%, 1% and 2% CLA, and the changes in CLA concentration, meat color, TBARS and oxymyoglobin concentration were investigated during 13 days of cold storage. The L* value increased with increasing the CLA level in patties, and the a* value of 0.5% CLA patty was higher than others. Also, oxymyoglobin concentration was not quickly decrease with higher levels of CLA, and TBARS of CLA patty was not rapidly increased during cold storage. These results imply that CLA could prevent the oxidation of myoglobin due to delay of the lipid oxidation.