EFFECT OF SUPPLEMENTATION OF QUERCETIN ON OXIDATION STABILITY OF CHICKEN THIGH

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***Abstract*—This study was performed to investigate the effects of dietary quercetin on oxidation stability of chicken thigh during cold storage for 7 days. Supplementation of 20 ppm quercetin showed higher pH value than other groups through all storage days, while 200 ppm did not increased the values with dose dependently. Also 20 ppm quercetin supplemented group showed less VBN value as much as antibiotics and vitamin E fed groups. Low dose (20 ppm) of quercetin supplementation was more efficient to prevent from lipid oxidation than 200 ppm quercetin and methylated form, respectively. From this result, it was concluded that the 20 ppm of quercetin supplementation may lower the oxidation susceptibility of chicken thigh during cold storage for 7 days.**

***Index Terms*— Quercetin, chicken thigh, Meat quality, Oxidation stability, VBN, TBARS**

I. INTRODUCTION

Oxidative quality deterioration of meat can be reduced by conventional antioxidants, butylated hydroxyanisole, butylated hydroxyl toluene, tetiarybutyl hydroquinone and propyl gallate. Since such synthetic antioxidants have shown toxicity (Han and Rhee, 2005), the needs of searching natural antioxidants has occured. Plant extracts have shown an antimicrobial and antioxidative effect *in vitro*, especially polyphenols of the extracts were readily react with single electron oxidants, resulting in powerful free-radical scavenging activity and complex with metal ion prooxidant to curtail anti-oxidant reactions (Decker and Xu, 1998). However, the effect of supplementation of natural products on the antioxidative activity of animal muscle is still controversial (Vinchi et al., 2001). Therefore, the objective of present study was to evaluate the effectiveness of dietary quercetin on anti-oxidative activity of raw chicken thigh from broilers during cold storage at 4℃ for 5 days.

II. MATERIALS AND METHODS

Day-old Ross 320 broiler chickens were obtained from a local commercial hatchery. Chickens were randomly assigned into four groups. A control group (T1) was fed a basal diet without antibiotics and T2 was basal diet with antibiotics (T2), with vitamin E 20 IU (T3), with vitamin E 200IU(T4), with quercetin 20 ppm (T5), with quercetin 200 ppm (T6), 20 ppm of methylated quercetin (T7) and 200ppm methylated quercetin (T8). The feeding trial for broilers composed of a starter diet until 21 d of age and grower diet until 35 d of age. Diets of control and treatments group achieved the same energy and protein levels with the extracts addition. At day 36, the broilers were sacrificed and thighs were immediately removed from the carcass then air packaged and stored in a refrigerator (4℃) until used.

III. RESULTS AND DISCUSSION

The effect of dietary supplementation with quercetin and its methylated quercetin on pH level in chicken thigh meat stored at 4℃ for 1, 3, and 7 days is in Fig. 1. T5, fed 20 ppm quercetin, showed higher value than other group through all storage days, while dose dependent manner in response was not shown. Effect of dietary quercetin on VBN value of chicken thigh meat was shown in Fig. 2. The values increased with increase of storage days, the VBN value of T5 (20 ppm quercetin fed group) showed no difference among that of antibiotics and vitamin E fed groups. In lipid oxidation of thigh meat, supplementation of vitamine E was strongly conctrolled TBARS values through storage days. Low dose (20 ppm) of quercetin supplementation was more efficient to prevent from lipid oxidation than 200 ppm quercetin and methylated form, respectively. Until storage day 3, 20 ppm quercetin was equvalent to antioxidation activity of antibiotics and vitamin E. From this result, it was concluded that the 20 ppm of quercetin supplementation may lower the oxidation susceptibility of chicken thigh during cold storage for 7 days.

IV. CONCLUSION

In conclusion, the quercetin supplemetnation reduce the oxidation susceptibility of chicken thigh during cold storage.

Therefore it can possibley utilized as natural food additives in the meat processing market.

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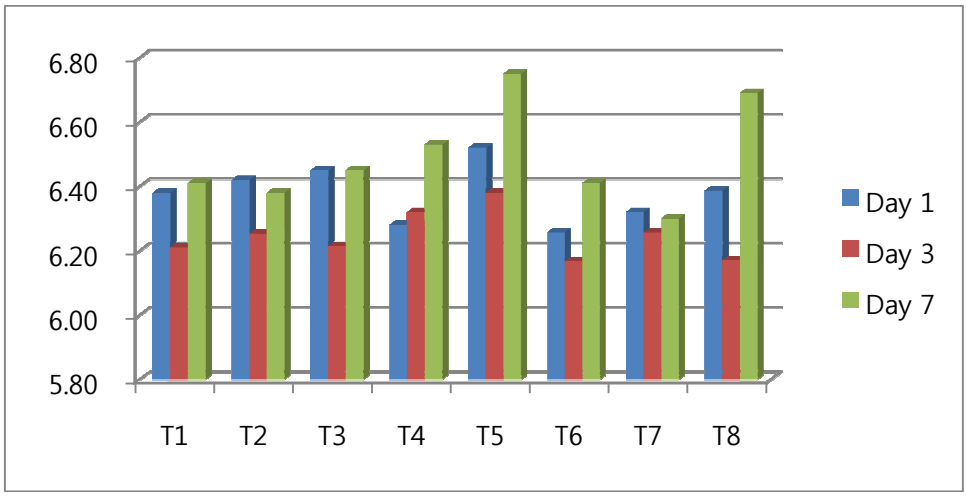

Fig. 1. Effect of supplementation of quercetin on change of pH value of chicken thigh meat

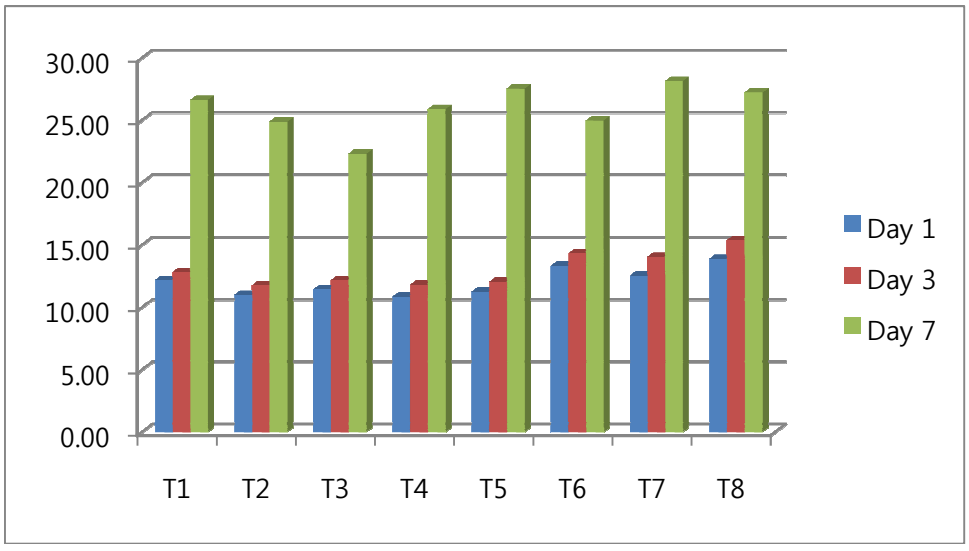

Fig. 2. Effect of supplementation of quercetin on change of VBN value of chicken thigh meat

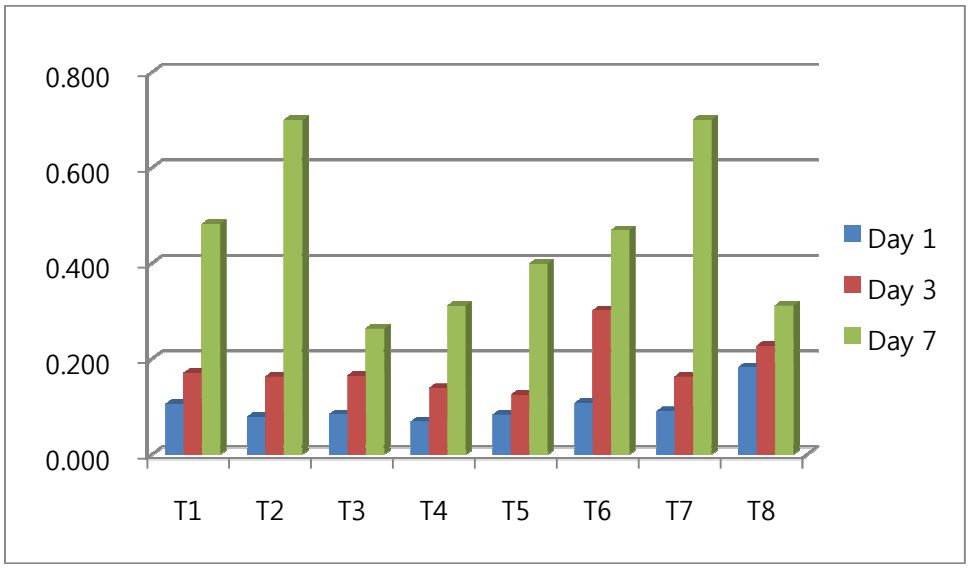

Fig. 3. Effect of supplementation of quercetin on change of TBARS value of chicken thigh meat