



## Muscle-Specific Color Stability in Fallow Deer (*Dama Dama*) Meat

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### Objectives

Color stability of fresh meats is the single most important trait affecting the consumers' purchase decisions. Meat color stability is influenced by muscle source, and muscle-specific color stability has been investigated extensively in traditional livestock. In contrast, limited scientific information is available on this phenomenon in game meats. Fallow deer (*Dama dama*) is a game species having significant market potential. The objective of the present study was to examine the color stability of three economically important muscles in fallow deer carcasses, namely infraspinatus (IS), longissimus lumborum (LL), and biceps femoris (BF).

### Materials and Methods

The IS, LL, and BF muscles were removed from both sides of six ( $n = 6$ ) female fallow deer carcasses 24 h post-mortem. The muscles were vacuum-packaged and stored at 2°C. After 48 h, the muscles were fabricated into twelve 2.5-cm steaks. The steaks were placed in trays, aerobically over-wrapped, and stored at 2°C for 8 d. Meat pH, instrumental color ( $L^*$ ,  $a^*$ , and  $b^*$  values), color stability (R630/580; ratio of reflectance at 630 nm and at 580 nm), surface myoglobin redox forms, metmyoglobin reducing activity (MRA), and lipid oxidation were measured on 0,

1, 2, 4, 6, and 8 d. Data were analyzed using mixed model repeated measures ANOVA, with carcass as random effect, and muscle and time as fixed effects.

### Results

The IS steaks had the greatest ( $P < 0.05$ ) pH, whereas the LL steaks exhibited the lowest ( $P < 0.05$ ) pH throughout the storage. IS demonstrated greater ( $P < 0.05$ )  $L^*$  values (lightness) than BF and LL during the storage. While  $a^*$  values (redness) decreased ( $P < 0.05$ ) in all muscles during storage, IS consistently exhibited greater ( $P < 0.05$ )  $a^*$  values than LL and BF. In addition, during the storage, IS demonstrated greater ( $P < 0.05$ )  $b^*$  values (yellowness), R630/580, MRA, and ferrous myoglobin forms (oxymyoglobin and deoxymyoglobin) than the LL and BF counterparts. Moreover, lipid oxidation and surface metmyoglobin content were lower ( $P < 0.05$ ) in IS than in LL and BF.

### Conclusion

The findings of this study indicated that IS muscle of fallow deer is more color-stable than the LL and BF counterparts during refrigerated storage under aerobic conditions. The game industry may employ muscle-specific strategies to process and improve marketability of fresh meat from fallow deer.