



Organic Trace Mineral Supplementation to Augment Pork Loin Color

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Objectives

Over the past several years, pork meat has become lighter and paler in color, decreasing consumer acceptance. Furthermore, the National Pork Board aims to improve the subjective color score of pork meat by 2020. Increased paleness could be due to inadequate iron levels, which could decrease myoglobin synthesis and deposition in skeletal muscle. The objective of this study was to determine if organically complexed trace minerals would promote myoglobin content and increase redness in pork meat.

Materials and Methods

At the start of the finisher period, 24 pigs were randomly allocated to one of two treatments: (1) corn-soy phase diets supplemented with 0.15% inorganic trace mineral premix at standard NRC levels (CON) or (2) corn-soy phase diets supplemented with 0.15% organic trace mineral premix (Bioplex and Sel-Plex; Alltech Inc.) at standard NRC levels (OTM). Premixes provided equal supplementation of trace minerals (3 ppm Cu, 40 ppm Fe, 2 ppm Mn, 50 ppm Zn, 0.15 ppm Se, and 0.14 ppm I) and both diets contained an enzyme complex providing P and Ca uplifts (Allzyme SSF). Pigs were fed respective diets 28 d prior to slaughter. Carcasses were chilled at 4°C for 24 h before both loins (*Longissimus lumborum*) were removed. Six 2.54 cm boneless loin chops were cut from each loin for duplicate packaging treatment per display day. Two chops were placed without stacking on polystyrene trays and overwrapped with an air-permeable polyvinylchloride film. Samples were placed in a retail display cooler at 2 to 4°C for up to 7 d. Meat quality was evaluated for lipid and protein oxidation, water-holding capacity, color, and shear force on display

d 0, 3, and 7. Data were subjected to analysis of variance (ANOVA) to determine the significance of main treatment factors (diet and storage time). Least Significant Differences (LSD) all-pairwise multiple comparisons were performed to separate the means when a treatment effect was found significant ($P < 0.05$).

Results

Overall, lipid oxidation in the meat increased throughout storage; nonetheless, there was no significant difference between dietary treatments throughout retail display. Protein carbonyl content and purge loss was significantly lower in OTM samples on display d 3 and 7 than in CON. However, there was no difference between treatments after cooking. Shear force was 8% ($P = 0.01$) lower in OTM samples (27.52 ± 1.82 N) than in CON samples (30.00 ± 2.20 N) on d 7 only. Colorimetric L^* (lightness) and b^* (yellowness) values did not differ between dietary treatments. Although a^* values (redness) were higher ($P < 0.05$) in OTM samples than in CON on retail storage d 3 and 7, the difference would not correspond to a notable visual effect. In agreement, myoglobin content was 33 and 18% higher in OTM samples than in CON on d 3 and 7, respectively.

Conclusion

The results of this study revealed that dietary supplementation with organic trace minerals resulted in similar or improved meat quality attributes versus control samples. Although feeding dietary organic trace minerals during the finisher phase increased a^* values and myoglobin content on storage d 3 and 7, the results did not correspond to a visual improvement of pork meat color in boneless loin chops.