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## Determining the Relationship between Early Postmortem Loin Quality Attributes and Aged Loin Quality Attributes Using Meta-Analyses Techniques

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### Objectives

The objectives were to: 1) evaluate changes in pork quality parameters during postmortem aging, 2) correlate early postmortem loin quality parameters with aged loin quality parameters, and 3) determine the predictive ability of early postmortem loin quality parameters on aged color and marbling as well as sensory tenderness, juiciness, and flavor using meta- and holo-analysis techniques.

### Materials and Methods

Eleven independent experiments were selected for inclusion in the analysis. Inclusion criteria included studies where pigs were slaughtered at a commercial facility, loins were evaluated on the ventral surface of the loins on d 1 postmortem, and then again after an aging period that ranged from 12 to 28 d. Data sets encompassed approximately 3957 loins. The effects of aging on ventral loin surface quality was determined using a paired-*t* test. Pearson correlation coefficients within original data sets were calculated and then sample-weighted mean correlations (*r*) and variances [Var(*r*)] were calculated across data sets. Stepwise regression, using a holo-analysis approach, was used to determine the predictive ability of early postmortem ventral color, marbling, firmness, and pH on sensory ratings.

### Results

Ventral loin surfaces became 8% lighter ( $P < 0.0001$ ), 44.5% redder ( $P < 0.0001$ ), and 46% more yellow ( $P <$

0.0001) during the aging period. Therefore, it was apparent that loin quality changes during postmortem aging. Because of this, it was necessary to determine the correlation between early and aged pork quality parameters. Early postmortem ventral instrumental lightness ( $L^*$ ) was moderately correlated with aged ventral  $L^*$  ( $r = 0.50$ ), aged ventral visual color ( $r = -0.38$ ), aged chop face (freshly cut)  $L^*$  ( $r = 0.44$ ), and aged chop face visual color ( $r = -0.38$ ). Early postmortem ventral instrumental redness ( $a^*$ ) was moderately correlated with aged ventral  $a^*$  ( $r = 0.49$ ) and aged chop face  $a^*$  ( $r = 0.46$ ). Early postmortem ventral visual color was moderately correlated with aged ventral  $L^*$  ( $r = -0.51$ ), aged ventral color ( $r = 0.50$ ), aged chop face  $L^*$  ( $r = -0.43$ ), and aged chop face visual color ( $r = 0.43$ ). However, no instrumental or visual color parameters were moderately or strongly correlated to instrumental tenderness or sensory panel ratings of tenderness or juiciness ( $|r| \leq 0.36$ ). Early postmortem ventral visual marbling was moderately correlated with aged ventral marbling ( $r = 0.63$ ) and aged chop face visual marbling ( $r = 0.56$ ). Visual marbling was not ( $|r| \leq 0.12$ ) correlated to instrumental tenderness or sensory panel ratings of tenderness and juiciness. The combination of color, marbling, firmness, and pH were poor predictors ( $R^2 \leq 0.13$ ) of sensory tenderness ( $R^2 = 0.13$ ) and juiciness ( $R^2 = 0.09$ ), but were moderately predictive of sensory flavor ( $R^2 = 0.28$ ).

### Conclusion

Early postmortem color and marbling are important pork quality traits in consumers purchasing decisions, but are poorly related to traits associated with eating experience.