

PORK QUALITY

Title: Characterizing the relationship between early postmortem loin quality attributes with 14 day aged loin quality attributes and sensory characteristics – NPB #16-220

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Scientific Abstract:

After fabrication and initial estimates of quality at 1d postmortem, boneless pork loins can be aged as intact loins or sliced for “case-ready” packages of loin chops. The objective was to determine the effect of aging method on loin chop quality and determine differences between aging methods for correlations among early and aged loin quality traits. Quality of boneless loins (N = 296) was evaluated at 1d on the ventral side. Loins were then allocated to either aging as intact loins (n = 144) or as case-ready chops (n = 152). Loins aged intact were vacuum packaged at 1d postmortem, aged at 4°C, and sliced into 28 mm thick chops at 12d postmortem. For case-ready packages, loins were sliced into 28mm chops at 2d postmortem, packaged in individual polyvinyl-chloride film overwrapped trays sealed in modified atmosphere packaging (MAP) bags at 4°C until 9d postmortem and then were displayed in a mock retail case. At 12d postmortem, instrumental color values were collected on one chop from each loin. Chops were then individually vacuum-sealed and aged to 14d postmortem, when Warner-Bratzler shear force (**WBSF**) and cooking loss were determined. Quality traits were compared between aging methods using a one-way ANOVA in the MIXED procedure of SAS. At 1d postmortem, quality traits were similar between aging methods ($P \geq 0.13$), except loins designated for case-ready packages were 0.29 units (a*) less red ($P = 0.03$) than those to be aged intact. After aging, however, chops from case-ready packages were 0.52 kg less tender (WBSF), had 9% greater cook loss, and had 6.79 greater L^* and 0.85 a* values (lighter and less red) than intact-aged chops ($P < 0.0001$). Correlations among early and aged loin quality traits within aging method were calculated in SAS using CORR procedure and compared between aging methods using a z-test for independent and dependent correlations. Early ventral lightness (L^*) and redness (a*) from intact-aged loins ($r = 0.52 L^*$; $r = 0.63 a^*$) and case-ready chops ($r = 0.45 L^*$; $r = 0.61 a^*$) were correlated with aged chop lightness and redness values, respectively. These correlation coefficients did not differ between aging methods ($P \geq 0.43$). Correlation coefficients between WBSF and extractable lipid, early ventral loin color and L^* did not differ ($P \geq 0.17$) between aging methods. Among early loin quality traits, only extractable lipid was correlated ($P \leq 0.05$) with WBSF. Therefore, while lightness, WBSF, and cooking loss differed between intact-aged and case-ready chops, correlations between early ventral and aged chop quality traits did not differ between aging methods. There were no differences in sensory traits ($P \geq 0.30$), slice shear force ($P = 0.13$), or cook loss ($P = 0.06$) among proposed USDA quality grades. There were no differences in sensory

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traits ($P \geq 0.06$), slice shear force ($P = 0.99$), or cook loss ($P = 0.12$) between packaging types. Chops cooked to 63° C were rated more tender ($P < 0.0001$), more juicy ($P < 0.0001$) but less flavorful ($P = 0.01$) than chops cooked to 71° C. Likewise, chops cooked to 63° C had lesser slice shear force values ($P = 0.01$) and cook loss percentages ($P < 0.0001$) than chops cooked to 71° C. Based on these data, cooking chops to 63° C rather than 71° C was a more effective way to improve eating experience than the newly proposed USDA quality grades. Further packaging type did not have any effect on eating experience of boneless loin chops aged for 14d postmortem.