

2018 Reciprocal Meat Conference – Meat and Poultry Quality

Meat and Muscle Biology™



Effect of Packaging Type during Postmortem Aging and Degree of Doneness on Pork Chop Sensory Traits of Loins Selected to Vary in Color and Marbling

B. J. Klehm^{1*}, D. A. King², A. C. Dilger¹, S. D. Shackelford², and D. D. Boler¹

¹Animal Science, University of Illinois, Urbana, IL, 61801, USA; ²U. S. Meat Animal Reserch Center, Clay Center, NE, 68933, USA

*Corresponding author. Email: bklehm2@illinois.edu (B. J. Klehm)

Keywords: degree of doneness, packaging, pork, quality grade, sensory
Meat and Muscle Biology 2(2):88

doi:10.221751/rmc2018.078

Objectives

Consumers use color and marbling as indicators of tenderness and juiciness when making purchasing decisions because they are perceived to influence eating experience. The USDA has proposed a quality grading system based on visual color and marbling of the ventral surface of a boneless pork loin. Previous reports show that a combination of increasing extractable lipid and a darker surface color increased instrumental tenderness of pork chops cooked to a medium-rare degree of doneness. So, it stands to reason that a USDA grading system has the potential to sort pork loins to provide a desired eating experience based on consumer expectations. Nearly half (49%) of boneless pork chops in the U.S. are distributed to retail stores as case-ready chops and the remainder (51%) as noncase-ready. It is not known if this difference in packaging affects sensory traits of boneless pork chops. On the other hand, it is readily accepted that cooking pork chops to a medium-rare degree of doneness improves sensory tenderness and juiciness compared with cooking chops to a medium degree of doneness. Therefore, the objective was to determine the potential interactive effects of packaging type and degree of doneness on sensory traits of pork loins selected to represent the newly proposed USDA quality grades.

Materials and Methods

A total of 144 loins were selected from 2 groups of pigs to represent as much variation in visual color and marbling as possible. The ventral surface of the loins were evaluated for loin quality traits at 1 d postmortem. At 2 d postmortem loins were sliced into 28 mm thick chops. Chops within each loin were randomly assigned to either individual vacuum packages or to individual Styrofoam trays and

overwrapped in polyvinyl chloride (PVC) oxygen permeable film. Overwrapped PVC packages were then placed in bulk packages and flushed with a gas mixture that contained approximately 0.4% carbon monoxide, 24.6% carbon dioxide, and 75% nitrogen. Vacuum-packaged chops were aged until 14 d postmortem. Chops packaged in PVC overwrap were aged until 9 d postmortem in bulk packaging, then placed in simulated retail display until 14 d postmortem. Chops from each packaging type were cooked to an internal temperature of either 63°C or 71°C for the evaluation of slice shear force (SSF) or sensory tenderness, juiciness and flavor. Data were analyzed as split-split plot design with proposed USDA quality grade, packaging type, and degree of doneness as fixed effects.

Results

There were no 3-way ($P \geq 0.19$) interactions and only 1 two-way interaction among quality grade, packaging type or degree of doneness. There were no differences in sensory tenderness ($P = 0.30$), juiciness ($P = 0.49$), flavor ($P = 0.89$), SSF ($P = 0.13$), or cook loss ($P = 0.06$) among USDA quality grades. There were no differences in sensory tenderness ($P = 0.06$), juiciness ($P = 0.32$), flavor ($P = 0.74$), SSF ($P = 0.99$), or cook loss ($P = 0.12$) between packaging types. Chops cooked to 63°C were 4.6% more tender ($P < 0.0001$), 10.1% juicier ($P < 0.0001$), and 2.9% less flavorful ($P = 0.01$) than chops cooked to 71°C.

Conclusion

These data suggest that cooking chops to 63°C rather than 71°C was a more effective way to improve tenderness and juiciness than selecting chops of a certain quality grade or altering packaging postmortem.