88 Factors influencing tenderness in a commercial line of pigs. P. J. Rincker*[1], J. Killefer[1], S. M. Lonergan[2], and F. K. McKeith[1], [1]*University of Illinois*, *Urbana*, [2]*Iowa State University*, *Ames*.

Variation in pork sensory quality has been attributed to variation in pH, lipid composition, postmortem aging, animal age and animal production systems. The extent to which each of these factors contributes to pork quality is of significant interest. For example, it has been noted that pork does not always become more tender when stored post mortem. This phenomenon of meat that does not tenderize when aged has been rarely documented but appears to be present in many populations. Therefore, it would be beneficial to define what contributes to variation in the rate and extent of tenderization of fresh pork. A commercial population of pigs with known variation in shear force values was used for this study. All animals were raised in a single production facility, were fed a common diet, and were harvested on the same day in a commercial slaughter plant. Time points for pH measurements included 45 min, 3 h, 6 h, and 48 h post mortem. At 48 h post mortem, boneless loins (N=184) were removed from vacuum bags and the blade end was removed at the tenth rib. Quality measurements included NPPC color, marbling, firmness, and Minolta L*, a*, and b* values. Chops were cut for determination of drip loss and proximate composition as well as for Warner–Bratzler shear force after 2, 7, 14, and 21 d aging in a vacuum bag and trained sensory panel evaluation after 14 d aging. Initial summary statistics indicated ranges in % extractable lipid from 1.03 – 4.48% and ultimate pH from 5.05 – 6.11. In spite of the relatively wide ranges, neither lipid content nor ultimate pH accounted for large amounts of variation in tenderness and shear force as determined by simple correlation coefficients (r–values). The r-value for ultimate pH and shear force ranged from –0.12 to –0.22 across all aging times, while for ultimate pH and sensory panel tenderness r=0.38 (14 d aging). The r–values of extractable lipid and shear force ranged from –0.18 to –0.26 while lipid and sensory panel tenderness was 0.14. Additionally, early post mortem pH measurements were not highly correlated with shear force values. Overall, marbling and pH measurements did not contribute to variation in sensory panel tenderness and Warner–Bratzler shear force in this sample.

Greater than 50% of the loins from this sample did not become more tender with aging. Three groups of loins that displayed unique aging curves were isolated from this initial population to further understand what may be contributing to differences in tenderness and rates of tenderization. Group 1 (N=10) was initially tender (as indicated by shear force of 2.48 kg after 2 d aging) and did not change with aging time. Group 2 (N=10) was initially tougher (2 d shear force of 3.39 kg) and also did not change with aging time. Group 3 (N=10) started with the highest shear force (4.32 kg), but after 21 d aging dropped to 2.98 kg. There were no statistical differences in any pH time point or extractable lipid between these three groups. Therefore, other parameters were investigated to determine their relationship with post mortem tenderization including: collagen content, glycolytic potential, muscle fiber type, sarcomere length, and desmin degradation.