

92 Effect of hydrodynamic pressure processing and aging on the tenderness and protein characteristics of pork loins. B. C. Bowker*, M. N. Liu, J. S. Eastridge, E. W. Paroczay, J. A. Callahan, and M. B. Solomon, *USDA-ARS, Food Technology and Safety Laboratory, Beltsville, MD.*

Hydrodynamic pressure processing (HDP) is a novel postharvest technology that utilizes high pressure shockwaves to tenderize meat. The effects of HDP on the tenderization and proteolysis associated with postmortem aging are not well understood. The objective of this study was to determine the effect of combining HDP and aging treatments on tenderness and protein characteristics of pork loins. Boneless pork loins (n=12) were split in half, with one end randomly assigned to HDP treatment and the other serving as a control. Following treatment on day 0, each half was divided into two portions, which were aged 0 and 7 days. After aging periods, samples were removed for Warner-Bratzler shear force (WBSF) determination, protein solubility measurements, and SDS-PAGE analysis of whole muscle protein extracts. At day 0, HDP and control samples did not differ in WBSF (4.54 vs. 4.82 kgf). After 7 days of aging, however, HDP treated samples were significantly more tender than controls (3.47 vs. 4.15 kgf). Myofibrillar and total protein solubility were higher ($p < 0.01$) in HDP samples compared to controls at day 0 but not at day 7. Sarcoplasmic protein solubility was not influenced by HDP, but decreased ($p < 0.05$) with aging. Overall, SDS-PAGE analysis of muscle protein profiles demonstrated a strong aging effect and only minor differences due to HDP treatment. In both HDP and control samples, bands corresponding to 32 kDa and 135 kDa increased ($p < 0.0001$) in intensity (relative to the actin band) between 0 and 7 days. Bands corresponding to 38 kDa and 95 kDa decreased ($p < 0.05$) with aging in HDP and control samples. The intensity of the 60 kDa band increased ($p < 0.05$) with both aging and HDP treatments. Thus, the similarities in muscle protein degradation patterns between control and HDP samples in this study suggest that HDP enhances aging tenderization in pork loins through the physical disruption of the muscle ultrastructure.