20 Effects of pH-enhancement on sarcomere length, desmin degradation, moisture retention, palatability and consumer acceptability of normal and callipyge lamb. A. K. R. Everts*[1], D. M. Wulf[1], T. L. Wheeler[2], A. J. Everts[1], and J. A. Daniel[1], [1]*South Dakota State University*, *Brookings*, [2]*Roman L. Hruska U.S. Meat Animal Research Center, ARS, USDA*, *Clay Center, NE*.

This research was to determine if pH-enhancement improved palatability of normal (NN) and callipyge (CN) lamb and to determine the mechanism by which palatability was improved. Ten ewe and 10 wether lambs of each genotype were harvested and carcass characteristics measured. Longissimus (LM) was removed at 2 d postmortem. Alternating sides served as either control (CON) or pH-enhanced (PHE). Designated PHE LM were injected to a target 120% by weight with a solution containing water, ammonium hydroxide, carbon oxide and salt (patented by Freezing Machines, Inc). Muscle pH, cooking loss, Warner-Bratzler shear force (WBS), sarcomere length, cooked moisture retention, and desmin degradation were evaluated for LM chops. Trained sensory panel rated LM juiciness, tenderness, and lamb flavor on 8-pt scales and off-flavors on 4-pt scales, while take home consumer panelists evaluated LM chops for raw and eating characteristics on 7-pt scales. The CN lambs had heavier live and hot carcass weights, less adjusted fat thickness, lower yield grades, and higher conformation scores than NN ($P < 0.05$). The NN LM had shorter sarcomeres (1.37 vs. 1.45 μm), lower WBS values (2.65 vs. 6.95 kg), higher juiciness ratings (5.60 vs. 4.98), more off-flavors (3.62 vs. 3.73), lower consumer ratings for raw characteristics [like of portion size (4.21 vs. 5.25), like of color (5.09 vs. 5.33), like of leanness (4.42 vs. 5.23), overall like of appearance (4.62 vs. 5.37)] and higher consumer ratings for eating characteristics [like of juiciness (5.76 vs. 4.73), like of flavor (5.61 vs. 4.89)] than CN ($P < 0.05$). The PHE LM had higher cooked moisture retention (72.62 vs. 65.90 %), lower WBS values (3.38 vs. 6.23 kg), higher juiciness ratings (5.43 vs. 5.15), less off-flavors (3.63 vs. 3.71), and higher consumer ratings for raw characteristics [like of portion size (5.04 vs. 4.41), like of color (5.54 vs. 4.88), overall like of appearance (5.15 vs. 4.84)] and eating characteristics [like of juiciness (5.61 vs. 4.88), like of flavor (5.43 vs. 5.07)] than CON ($P < 0.05$). Significant genotype by treatment interactions occurred for muscle pH, desmin degradation, tenderness, lamb flavor intensity, consumer like of texture/tenderness, and consumer overall like of eating quality ($P < 0.05$). The PHE LM had increased muscle pH, more for NN (5.94 vs. 6.92) than CN (5.89 vs. 6.35, $P < 0.01$). pH-enhancement increased desmin degradation for NN (90.10 vs. 94.26 %), but decreased desmin degradation for CN (40.83 vs. 34.56 %, $P < 0.01$). pH-enhancement improved tenderness ratings for CN (4.24 vs. 5.74) more than for NN (5.96 vs. 7.04, $P < 0.05$). For lamb flavor intensity, PHE decreased ratings for NN (5.18 vs. 4.42, $P < 0.01$), but had no effect for CN (4.74 vs. 4.74). For consumer like of texture/tenderness, PHE improved ratings for CN (3.68 vs. 5.06) more than for NN (5.49 vs. 6.17, $P < 0.01$). For consumer overall like of eating quality, PHE improved ratings for CN (4.03 vs. 5.03) more than for NN (5.46 vs. 5.87, $P < 0.05$). In summary, pH-enhancement had little to no effect on sarcomere length and desmin degradation, but improved palatability of normal and callipyge lamb, by increasing cooked moisture retention, improving consumer acceptability of callipyge lamb to near-normal levels.