268 Microbiology and evisceration efficiency of carcasses of broilers slaughtered and held up to 8 hours postmortem prior to scalding and defeathering. Dianna V. Bourassa*1, Kim M. Wilson1,2, Caitlin E. Harris2, and R. Jeff Buhr1, 1USDA-ARS US National Poultry Research Center, Athens, GA. 2University of Georgia, Athens, GA.

The implementation of on farm slaughter could eliminate potential animal welfare issues associated with cooping, transport, dumping, and shackling live broilers. This research evaluated evisceration efficiency and the microbiological implications of delaying scalding and defeathering for up to 8 h after slaughter. Live male broilers were obtained from a commercial processing plant and in batches of 10 were stunned at 15 V for 10 s, and bled for 2 min. Carcasses that were held before scalding were transferred to stationary shackles and remained suspended by their feet for 1, 2, 4, or 8 h. All carcasses were hard scalded at 60°C/140°F for 90 s and defeathered for 30 s. Carcasses were sampled post-evisceration from the 0 or 8 h groups for microbiological analysis. Whole carcass rinses (WCR) were sampled for aerobic plate count (APC), Enterobacteriaceae (EB), Salmonella, and Campylobacter. Ilea and ceca were sampled for Lactobacillus, EB, total anaerobes, Salmonella, and Campylobacter. For WCR APC, EB, and Campylobacter were higher (5.38, 4.64 log10 cfu, 100%) at 8 h compared with 0 h (4.73, 4.02 log10 cfu, 40%). EB and total anaerobes were higher at 8 h (6.30, 6.74 log10 cfu) compared with 0 h (4.51, 4.98 log10 cfu) for ilea while there was no difference in Lactobacillus, Salmonella, or Campylobacter. For ceca no differences were detected between 0 and 8 h. Carcasses were examined post-pick for broken bones and for evisceration efficiency. For 0 and 1 h groups no carcasses had broken bones. After 2 and 4 h, 7% of carcasses had a broken bone and after 8 h 30% had a broken bone. For evisceration at 0, 1, 2, 4, and 8 h, packs were not transferred for 5, 7, 13, 7, and 10% of carcasses, respectively. These experiments reveal that increases in APC, EB, total anaerobes, and Campylobacter 8 h post-slaughter from WCR and/or ilea samples may be a concern that will need to be addressed. Carcasses subjected to delayed scalding/defeathering appear to eviscerate as efficiently as non-delayed carcasses but may have more broken bones possibly due to less pliability during defeathering.

Key Words: delayed scalding, whole carcass rinse, ilea, ceca, broiler

269 Feather retention force in carcasses of broilers slaughtered and held up to 8 hours postmortem prior to scalding. R. Jeff Buhr*1, Dianna V. Bourassa1, Kimberly M. Wilson1,2, and Caitlin E. Harris2, 1USDA-ARS US National Poultry Research Center, Athens, GA. 2The University of Georgia, Athens, GA.

One factor that could affect the feasibility of commercial on-farm slaughter of broilers is the time delay from on-farm slaughter to scalding and defeathering in the commercial plant that could be 4 h or more. This experiment evaluated feather retention force (FRF) in broilers that were slaughtered (stunned and exsanguinated) and remained shackled by their feet for 0, 1, 2, 4, or 8 h before scalding. Commercial male broilers were individually weighed, shackled in batches of 5, stunned, exsanguinated, and then carcasses transferred to stationary shackles and held. The wing secondary remiges (pulled distal to proximal #4-#9) and tail rectrices (pulled lateral to medial #7-#2) feathers were extracted parallel to their insertion and maximum FRF recorded with a digital gauge. Feather tracts were sampled contralaterally alternating left or right side before and after scalding. For the wings, FRF values were similar for 0 to 4 h postmortem (3,150 to 3,343g) but significantly declined at 8 h (2,681g). For the tail FRF values were similar at 0, 1, and 2 h (1,237 to 1,115g) but declined at 4 and 8 h (975 and 1,035g). Scalding lowered wing FRF from 3,150 to 421g at 0 h and values remained significantly higher (640 to 755g) for carcasses held for 1 to 8 h. Scalded tail feathers had the lowest values at 4 h (677g) and highest values at 1 and 2 h (841 and 869g). When carcasses were held for 4 or 8 h at 4°C FRF was elevated for both wing (10 to 41%) and tail (31 to 41%) feathers. In contrast holding carcasses for 4 or 8 h at 40°C resulted in lower FRF for the wing (~69 to ~76%) and the tail (~67 to ~80%) feathers. This pattern persisted following scalding, carcasses held at 4°C had elevated wing (71 to 84%) and tail (50 to 76%) FRF and carcasses held at 40°C had lowered FRF after scalding for wing (~75 to ~79%) and tail (~70 to ~86%) feathers. Scalding lowered FRF of wing feathers (79%) more than tail feathers (30%) assumed to be associated with the thinner tissue layers surrounding the feather follicles in the wing. Holding slaughtered carcasses for 4 h should not affect the efficiency of defeathering as measured by FRF.

Key Words: scalding, feather retention force, broiler

270 Using instrumental compression to assess hardness of woody breast fillets and changes during short-term storage. Xiao Sun*, Famous L. Yang, Vishwesh V. Tijare, Jessica L. Solo, Yanbin Li, and Casey M. Owens, University of Arkansas, Fayetteville, AR.

Woody breast is characterized by a distinct hardness of the breast fillet. A scoring system using tactile evaluation was recently developed in our lab to assess the severity of the condition. However, an instrumental means of assessing this rigidity would be useful in identifying woody breast. This study was conducted to determine the effectiveness of measuring compression forces to distinguish between varying degrees of fillet hardness and to determine if hardness of fillets changes during short-term storage. In experiment 1, fillets (n = 84 in 2 replications) were collected from broilers processed at 63d of age and categorized in normal (NORM), moderate (MOD) and severe (SEV) categories of woody breast, based on tactile evaluation of hardness. Fillets were compressed to 20% of the fillet height using a 6 mm flat probe on a texture analyzer (Texture Technologies, Inc.) and force required to compress the fillet was measured. The compression test was conducted on d 1, 4, 8 and 13. In experiment 2, fillets (n = 80 in 2 replications) were collected from broilers processed at 54d of age and were categorized as either NORM or SEV for woody breast. Compression tests were conducted at 1, 2, 3, 4, 5, 6, and 8 d of storage. In experiment 1, compression forces increased as severity of woody breast (tactile hardness) increased (P < 0.05); SEV was greater than MOD, which was greater than NORM (P < 0.05). Compression forces were higher (P < 0.05) at d 1 of storage compared with d 4, 8, and 13, which were similar (P > 0.05) suggesting a greater change between 1 and 4d of storage. However, SEV fillets had higher (P < 0.05) compression forces than MOD and NORM throughout 13d of storage whereas there were no differences (P > 0.05) between MOD and NORM at 4, 8, or 13d of storage. In experiment 2, compression forces were higher in the SEV compared with NORM (P < 0.05) at all days. When assessing changes during storage through 8 d, d 1 had higher forces compared with all other storage times (P < 0.05). The results of this study indicate that woody breast has higher compression forces, and the degree of hardness decreases over time.

Key Words: compression, woody breast, meat quality, broiler, force
The effects of dietary supplementation of \( \alpha \)-methionine and 2-hydroxy-4-(methylthio) butanoic acid (HMTBa) on broiler meat quality. Ji Yang Fang1, Gerardo Casco2, Rocky Latham3, Jason Lee2, Sriperm Sriperm1, Rob Shirley3, and Christine Alvarado1,2,1Dept. of Nutrition and Food Science, Texas A&M University, College Station, TX, 2Dept. of Poultry Science, Texas A&M University, College Station, TX, 3Adisseo USA, Alpharetta, GA.

The objective of this study was to define the effect of digestible total sulfur amino acid (dTSAA) levels on meat quality. In a basal diet that contained a digestible lysine level of 0.90%, \( \alpha \)-Met was supplemented into a basal diet at 0.197%, or 0.395%; this resulted in dTSAA levels of 0.491, 0.687, and 0.882%. Supplementing HMTBa into the basal diet at 0.222%, a dTSAA of 0.687% was achieved. The 4 respective treatments were fed to male Cobb 500 × MX broilers from 35 to 49 d of age (13 replicate pens/treatment; 21 birds/pen). From each treatment, 6 birds per replicate were slaughtered and deboned on d 50 (n = 312). Boneless and skinless breasts were measured for drip loss (DL), cook loss (CL), color (L*, a*, b*), pH, and water holding capacity (WHC). In addition, DL and CL were determined on skinless, bone-in thigh meat. All data were analyzed using ANOVA, with LSMeans set at a \( P \)-value of < 0.05. While increasing the level of dTSAA did not affect incidence of woody breast (\( P > 0.05 \)), samples that had an incidence of “woody breast (\( P < 0.05 \)) and 0.882% (\( P > 0.05 \)). WHC was significantly higher for the dTSAA treatments of 0.882% and 0.687%. No significant difference was found in the meat quality measurements among the 3 dTSAA levels. No significant difference in DL, CL, color, and pH was identified between the 2 methionine sources, DL-Met and HMTBa at 0.687% dTSAA. In conclusion, supplementing either source of methionine at a dTSAA level of 0.687% resulted in breast meat with a lower L* value (darker color meat) and an overall superior meat quality.

Key Words: selenium, hydroxy-selenomethionine, turkey meat quality

273 Effect of onion extract on oxidative stability and physico-chemical and sensory properties of marinated broiler meat during refrigerated storage. Olubunmi O. Olusola*, Kehinde A. Tella, and Olusegun D. Oshibanjo, University of Ibadan, Ibadan, Oyo State, Nigeria.

Onions are consumed for their flavor and health benefits. These beneficial properties seem to strongly relate to the high content of sulfur compounds and flavonoids, which act as antioxidants, antibiotics, and anticarcinogens. This study investigated the antioxidative effect of onion extracts on quality and sensory properties of broiler meat as affected by refrigerator storage. Fresh average-sized white onion bulbs (20) were obtained, peeled, washed, chopped, and oven-dried at 40°C until constant weight was reached. Then, 500 mL of methanol was used to soak 100 g of the oven-dried onion for 24 h. Twelve broiler chicken (1.5 ± 0.2 kg) live weight of 56 d age were obtained, and 800 g of the breast muscle was marinated in brine solution and onion extract. The marinade consisted of 16 mLs of onion extracts and 14 g of table salt added to 4 L of water. Marinade solution was kept at 4°C before breast meats were immersed. Marinated meat was pan fried to an internal temperature of 77°C ± 3°C for 15 min after 11hrs of marination and committed to completely randomized design. Moisture content was significantly high on the 4th day. Proximate composition increased with days of storage with d 2 having the highest mean value (31.88%). Days 2 and 4 had the same percentage of either extract. pH was significantly high on d 2 and d 6 (6.02 and 5.92 respectively). Day 4 had the highest TBARS value (0.58). Yeast, Mold and Bacteria were not recorded on the first day but increased progressively from d 2 to 6. Day 6 had the highest coliform and total plate count content of 3.63 and 3.62 respectively. Aroma, flavor, juiciness and overall acceptability reduced progressively while there was no significant difference in color for fried meat samples. It can be concluded that onion extract could inhibit microbial load and improve shelf life up to 4 d of refrigerated storage.

Key Words: Onion extract, broiler breast meat, physico-chemical properties