Previous studies have shown that spray application of hydrogen peroxide (H₂O₂) followed by UV light exposure is an effective method of eggshell disinfection. Previously, this procedure has been applied in a manual, laboratory-scale manner. In order to make the process more feasible for commercial application, a prototype apparatus was constructed to automate the H₂O₂ spraying and UV light exposure process. Three experiments were conducted to evaluate the effectiveness of the apparatus for disinfecting eggshells. The first experiment used 15 visibly clean floor eggs. Ten of the eggs were treated using the sanitization machine while the other five served as controls. Experiment 2 was conducted over five consecutive days using visibly clean nest eggs. Each day, 300 eggs were collected, and half were treated using the machine while the other half were not. Each day, five eggs were randomly selected from the treated and control groups for enumeration of total aerobic plate counts (APC). Experiment 3 was designed to assess the effect of conveyor speed on effectiveness. The two conveyor speeds used in the experiment were 5.5 cm/sec and 10.2 cm/sec. In all experiments, total eggshell aerobes were enumerated by rinsing the egg in 20 ml of sterile PBS, followed by inoculation of 1 ml of rinsate onto Petrifilms. For eggs yielding zero counts, a value of 10 CFU/egg was used for calculation of mean eggshell counts. In Experiment 1, APC of treated eggs was lower than that of control eggs (1.4 log CFU/egg vs 4.4 log CFU/egg). The 25 treated nest eggs in Experiment 2 had an average APC of 1.2 log CFU/egg while the untreated controls averaged 4.5 log CFU/egg. In Experiment 3, conveyor speed did not influence effectiveness of the process. Average APC of the eggs treated at the slower and faster speeds was 1.1 and 1.3 log CFU/egg, respectively. Untreated control eggs averaged 4.5 log CFU/egg in Experiment 3. The results of these 3 experiments demonstrate that eggshell sanitization via H₂O₂ and UV light application can be highly effective at commercially feasible speeds.

Key Words: Eggshell, disinfection, UV light, hydrogen peroxide, machine

M44 Disinfection of poultry transport coops with a compressed air foam system Carolee Hinojosa1,2,3, David Caldwell1, Erin Fowlkes1, Martia Ross2, Stephanie Iset1, Javier Garcia1, Jason Lee1, James Byrd1, Morgan Farnell1 1Department of Poultry Science, Texas A&M AgriLife Research and Extension, College Station, TX 2USDA - Agricultural Research Service - Southern Plains Agricultural Research Center, College Station, TX

Transport coops are infrequently washed and have been demonstrated to cross contaminate broiler carcasses. We hypothesized that peroxy-acetic acid or Chlor-a-foam®, commonly used within poultry processing plants, can also be used to disinfect transport coops when applied via a compressed air foam system (CAFS). A mixture of fresh layer manure and concentrated Salmonella Typhimurium (ST) was evenly applied to the floors of four pre-cleaned transport coops and allowed to dry for thirty minutes. Treatments consisted of a (1) water rinse only, (2) product application with a water rinse, (3) product application followed by power washing and (4) power washing followed by application of product. Each foaming treatment was applied with a compressed air foam system and allowed 10 minutes of contact time. Samples were aseptically collected from the transport coops prior to and following treatment utilizing a sterile 2 X 2 inch stainless steel template and a gauze swab pre-enriched with buffered peptone water. The Chlor-a-foam® cleaner significantly (P<0.05) reduced aerobic bacteria and ST by 2.77 to 4.84 logs across application methods. The PAA disinfectant significantly (P<0.05) reduced aerobic bacteria and ST by 3.99 to 5.17 logs across application methods. These data indicate that a compressed air foam system may be used in combination with a commercially available cleaner or disinfectant to reduce aerobic bacteria and ST on the surfaces of commercial poultry transport coops.

Key Words: Disinfection, Salmonella, food safety, transport coops, chicken

M45 Correlation between footpad dermatitis, walking ability, and performance in turkeys at market age Manuel João Da Costa1,2,3, Jesse L. Grimes, Edgar O. Oviode-Rondón, Ilana Barasch, Caitlin Evans, Marcelo Dalmagro, Jessica Nixon Department of Poultry Science North Carolina State University, Raleigh, NC

Footpad dermatitis (FPD) and walking ability are both parameters used on poultry welfare audits however there is not much information about their relationship with live performance. One survey was conducted to determine the correlation between FPD severity, gait score (GS), body weight (BW) and litter condition on turkeys at market age. A total of 24 commercial tom flocks, of 16 to 19 weeks of age, were evaluated between May 2011 and September 2012. On each visit, 50 toms were selected, weighed and evaluated for GS and FPD. The GS system consisted in 6 levels. Turkeys with no abnormalities were classified as 0 and turkeys showing reluctance to move and high degree of limping as 5. The FPD lesions were classified in 8 levels being 0 normal footpads and 7 generalized footpad ulceration. Litter was also scored from 1 to 5 according to moisture content and caking. Data analyses consisted in pairwise correlations and three separate multiple linear regression models using FPD, GS and BW as response variables. Fixed effects included litter score, hatching day within a year, FPD, GS, and BW. Genetics, company and age were used as covariates. Pairwise correlations indicated significant but weak correlations of FPD with age (r=0.30) and BW (r=0.20). The GS was correlated with BW (r=0.25) and litter score (r=0.31). In addition, BW was also correlated with litter score (r=0.18). On multiple linear regression analysis it was observed that litter conditions, BW and GS affected (P<0.001) FPD severity. As litter condition and walking ability worsened and turkeys became heavier the FPD severity increased. Walking ability was mainly affected by litter score (P<0.001). High scores of litter decreased turkey walking ability. Moreover increasing BW and FPD severity also affected (P<0.001) negatively GS. The BW was affected (P<0.001) in a similar way by FPD and GS. A negative effect (P<0.001) was observed by FPD and GS on BW. In conclusion, FPD, GS and BW are correlated and litter condition is a major factor in FPD development and locomotion ability.

Key Words: turkeys, welfare, footpad dermatitis, walking ability

Processing & Products

M46 Germicidal Ultra-Violet Light to Eliminate Low Numbers of Listeria monocytogenes on Raw Chicken Meat Mark Berrang1, Richard Meinersmann USDA-ARS Russell Research Center, Athens, GA

Listeria monocytogenes can be transferred from broiler slaughter plants to commercial cooking plants with raw product. Once in a cooking plant, this organism can become a long term resident and colonize floor drains. Earlier work showed that during plant wash down, an inadvertent short hose spray can result in low numbers of airborne Listeria being transferred to surfaces and product. Germicidal ultra violet light (5 min at 1000 µW/cm²) is effective to lower numbers of inoculated L. monocytogenes on raw breast fillets from about 10⁶ to 10⁴. In the cur-
rent study we tested the use of lower doses of germicidal ultra violet light (5, 3 or 1 min at 800 µw/cm²) to eliminate L. monocytogenes at the levels that we estimate can be transferred during processing plant wash down. Fresh skinless boneless breast fillets were inoculated with a mean of 42 cells streptomycin resistant L. monocytogenes. Ten minutes after inoculation, fillets were treated with ultra violet light (254 nm, 800 µw/cm²) for 0, 1, 3 or 5 minutes. After treatment, all fillets were rinsed with Listeria enrichment broth and the number of L. monocytogenes per fillet was determined by a three tube most probable number technique following the enrichment protocol used by USDA-Food Safety Inspection Service. Five replications were completed with five fillets per replication for a total of 25 per treatment. A mean of 38.7 cfu L. monocytogenes was detected on untreated control fillets. Five minutes of ultra-violet treatment lessened the number detected to a mean of 0.95 cfu, three minute treatment resulted in 0.47 cfu per fillet and 1 min 0.56 cfu per fillet. Pre-shipment treatment of raw broiler parts with germicidal ultra violet light for one minute is can greatly lower the number of accidentally acquired L. monocytogenes and therefore lessen the likelihood of transfer of this organism to a cook plant with contaminated raw product.

**Key Words:** Listeria monocytogenes, Ultra-violet light, broiler meat

M47 Media for the Aerobic Growth of Campylobacter Arthur, Jr. Hinton* USDA-ARS Russell Research Center, Athens GA

The effect of agar and sodium bicarbonate (NaHCO₃) concentration on aerobic growth of Campylobacter in a fumarate-pyruvate medium was examined. The broth medium was supplemented with 0.0 to 0.2% agar and inoculated with 10⁴ CFU/ml of Campylobacter coli 33559, Campylobacter fetus 27349, Campylobacter jejuni 33560, or Campylobacter jejuni 49349. Portions of the inoculated media were transferred to wells of a honeycomb plate and placed in a Bioscreen Microbiology Reader. Cultures were then incubated aerobically at 37°C for 72 h, and culture optical density (OD) was measured at 600 nm. Next, fumarate-pyruvate media containing 0.15% agar was supplemented with 0.00 to 0.10% NaHCO₃ and inoculated with Campylobacter. Cultures were incubated and growth was measured as previously described. Finally, experiments were conducted to determine the number of CFU of Campylobacter/ml recovered from media supplemented with 0.15% agar and 0.05% NaHCO₃, inoculated with 10⁴ CFU/ml of Campylobacter spp., then incubated aerobically or microaerophilically for 72 h at 37°C. After incubation, Campylobacter was enumerated by plating serial dilutions of inoculated media on Campylobacter selective agar and incubating microaerophilically at 42°C for 48 h. Results of experiments indicated that the OD of cultures of all Campylobacter isolates was significantly higher when grown in fumarate-pyruvate broth media containing added agar. Furthermore, the addition of NaHCO₃ to the medium supplemented with agar produced a significant increase in the OD of most of the isolates during early periods of growth. Also, after 72 of incubation there was a 5 to 6 log increase in the number of Campylobacter recovered from inoculated media containing 0.15% agar and 0.05% NaHCO₃, and there was no significant difference in the number of CFU recovered from media incubated aerobically or microaerophilically. Findings from this study indicate that cultivating Campylobacter in a fumarate-pyruvate broth medium supplemented with agar and NaHCO₃ might provide an alternative to current procedures of incubating Campylobacter under microaerophilic conditions. Use of the medium could eliminate the additional expense and training required for growing Campylobacter in microaerophilic atmospheres.

**Key Words:** Campylobacter, aerobic growth, agar, sodium bicarbonate

M48 Reduction of Salmonella in skinless, boneless chicken breast fillets by lauric arginate Chander Shekhar Sharma*, Amanda Ates, Poulson Joseph, Rama Nanapanneni, Aaron Kiess Department of Poultry Science, Mississippi State University, Mississippi State, MS

Lauric arginate (LAE) is a USDA approved antimicrobial for use in meat and poultry products and has been found effective against various foodborne pathogens. The objective of this study was to evaluate the effectiveness of LAE at reducing Salmonella on fresh, skinless and boneless chicken breast fillets. The effect of LAE treatments on total aerobe counts, pH and color of breast fillets was also determined. Chicken breast fillets were inoculated with a four strain Salmonella cocktail (S. Enteritidis ATCC 4931, S. Heidelberg ATCC 8326, S. Kentucky ATCC 9263 and S. Typhimurium ATCC 14028) and treated with sterile DI water (positive control), 200 ppm and 400 ppm of LAE. After treatments, the chicken breast fillets were stored at 4 °C and analyzed on d 0, 1, 3, 5, and 7 for Salmonella, total aerobes, color and pH. The fillets treated with 400 ppm LAE had lower (P < 0.05) Salmonella counts as compared to the positive control on d 0, 1, 5 and 7 of storage whereas 200 ppm of LAE caused significant reduction in Salmonella counts (P < 0.1) on d 0, 1 and 7. The log cfu/g reductions for Salmonella ranged from 0.7 to 1.0 and 0.7 for 400 ppm and 200 ppm treatments, respectively. No treatment effect was observed on the growth of mesophilic microorganisms, pH and color of chicken breast fillets (P > 0.05) following 200 ppm and 400 ppm treatments of LAE. The results from the present study indicate that surface application of LAE was effective in reducing Salmonella in chicken breast fillets during refrigerated aerobic storage without negatively affecting the color of chicken breast fillets.

**Key Words:** lauric arginate, Salmonella, chicken breast fillets, color, total aerobes

M49 Essential oil blend reduces numbers of Salmonella and Campylobacter on inoculated broiler breast meat and wings Rajani Thanissery**, Douglas Smith Department of Poultry Science, North Carolina State University, Raleigh, NC

Plant essential oils are natural compounds studied for their potential antimicrobial properties. Recent disc diffusion assays and broth dilution techniques have demonstrated that low concentrations (0.13% v/v) of thyme and orange oil (TO) blend is effective against both Salmonella and Campylobacter species. Three separate experiments were conducted to determine if TO applied to broiler breast meat and wings would reduce pathogens. For each experiment 12 fresh breast fillets and 12 wings were procured from a local poultry processing plant. TO mixed with Dimethyl sulfoxide (DMSO) was added to sterile water to achieve final concentration of 0.25% and 0.5% v/v of TO blend. Each cut-up part was subjected to four treatments, a 0.25% TO, 0.5% TO, a positive control (no TO), and a negative control (DMSO only). Each part was dipped in a mixture of inoculum containing approximately 10⁶ cfu of 200 ppm nalidixic acid-resistant S. Enteritidis and 10⁶-10⁷ cfu of 100 ppm nalidixic acid-resistant Campylobacter coli. Each breast fillet or wing subjected to TO or DMSO treatments was dipped in respective concentrations of test solution for one minute. Parts were placed individually in sterile bags, 25 mL of buffered peptone water was added and shaken for 30 seconds. Serial dilutions were conducted and plated on both Brilliant Green Agar w/Sulfadiazine and CCDA (Campylobacter blood-free selective medium ) plates containing 200 ppm and 100 ppm of nalidixic acid respectively. Results from the three experiments showed that 0.5% TO treatment significantly reduced (P < 0.05) Salmonella and Campylobacter on wings and breast fillets. Salmonella was reduced by 1.38, 1.50, and 1.71 logs on breast fillets and 1.16, 7.36, and 4.49 logs on wings. Campylobacter was reduced by 0.33, 2.64, 3.97 logs on breast fillets and 1.10, 3.20, and 4.61 logs on wings. The 0.25% TO blend was not different from the positive and the negative controls for all experiments. In conclusion the 0.5% TO blend reduced
both Salmonella and Campylobacter on broiler parts, and could be used to enhance food safety of raw chicken products.

Key Words: Salmonella, Campylobacter, breast meat, wings, thyme orange oil

M50 Chill Water Additive Controls Transfer of Salmonella and Campylobacter by Improved Chlorine Efficacy Brad Schambach1, Mark Berrang2, Mark Harrison2 1USDA-ARS Russell Research Center, Athens, GA 2Food Science Department, University of Georgia, Athens, GA

In earlier work, we showed that a proprietary additive (T-128) maintains chlorine activity in the presence of organic material such as broiler parts. T-128 improves the efficacy of chlorine to control transfer of Campylobacter and Salmonella from inoculated wings to un-inoculated wings during immersion chilling. However, T-128 causes a substantial drop in pH, and it is unclear if the beneficial effect is simply due to the enhanced acidic conditions. The objective of this study was to compare the effectiveness of T-128 to its acid component (phosphoric acid, H3PO4) to lower numbers of Salmonella and Campylobacter transferred in chill water. To test this, four containers were prepared containing two broiler wings, water, and ice in a weight to weight ratio of 1:2.4 chicken meat to water to ice. One of the two wings was inoculated with approximately 106 cells each of an antibiotic resistant strain of Salmonella and Campylobacter; the second wing was left uninoculated. Containers were assigned to each of two treatments, as follows: a combination of 50ppm chlorine and 0.5% T-128 by volume, and a combination of 50ppm chlorine and 0.01% H3PO4 by volume. Both treatments resulted in initial water pH of 3.5. All containers were covered and shaken at 130 rpm for forty-five minutes. After the 45-minute chill treatment, pH of T-128 solution averaged 6.04 with a free chlorine level of 10 ppm. The H3PO4 solution however, had a mean pH of 5.86 with a free chlorine level less than 0.10 ppm. Each wing was rinsed in 30 mL of PBS. Antibiotic resistant markers marked Salmonella and Campylobacter were enumerated per mL of rinse solution by plating on BG-Sulfa agar with the addition of nalidixic acid and Campy-Cefex agar with the addition of gentamicin, respectively. Following chill treatment, no statistically significant difference in the number of Salmonella was detected per mL of chill water; however, T-128 treatment resulted in significantly (P < 0.01) fewer Campylobacter per mL of chill water. T-128 treatment also resulted in significantly (P < 0.01) fewer Salmonella and Campylobacter detected from un-inoculated wings than the acid only treatment. These data suggest that T-128 used in conjunction with chlorine has the ability to control cross contamination of poultry carcasses with human pathogens during immersion chilling by a greater chemical interaction than simply solution pH reduction.

Key Words: Bacterial Reduction, chill tank, solution pH, Campylobacter, Salmonella

M51 Effect of zinc and sex on broiler blood zinc protoporphyrin, raw marrow color, and cooked meat color Rasha Qudsieh*, Baasheer Nusairat, Doug Smith, John Brake Poultry Science Department, North Carolina State University, Raleigh, NC

Red discoloration of cooked poultry meat is a significant problem for fully cooked poultry products. Redness has been shown to occur due to excessive zinc levels in processed meat and may vary due to gender. The objective of this study was to determine the effect of dietary zinc supplementation and sex on zinc protoporphyrin (ZPP) levels in blood, CIE a* (redness) of raw bone marrow, and redness of cooked meat from broiler chickens. Broilers were fed diets containing 0, 120, or 240 mg Zn /kg diet. A total of 144 males and females were processed at 56 d of age, and 2 femurs were collected from each bird. Blood samples were taken from each bird and ZPP measured. Bone marrow was collected from the interior epiphyseal end caps of femurs. Marrow was minced and color was measured. Marrow was placed in glass tubes adjacent to broiler breast meat and cooked to an internal temperature of 75 C, and immediately cooled. Meat color was measured at the contact surface with the marrow. Dietary zinc had no effect on ZPP, raw marrow or cooked meat color. Excessive levels (224 mg/kg) of zinc found in the used litter utilized in all pens may have contributed to the lack of observed dietary effect. Females had significantly higher ZPP values than males (54.3 vs. 40.8 mmol/mol, respectively). Redness of raw bone marrow was higher in females than males (34.1 vs. 30.8, respectively). Cooked meat redness was not affected by sex (13.62 vs. 14.92, respectively). In this study, dietary zinc did not affect ZPP, marrow or meat color, but females showed elevated ZPP levels and marrow redness. Additional studies will be required to determine effect of zinc and sex on ZPP, and bone marrow and meat color

Key Words: Broilers, Red discoloration, Zinc protoporphyrin, Bone marrow, Cooked meat

M52 Cook yield, shear value, and color of breast fillets from broilers fed diets containing different levels of zinc, copper, and Roxarsone Rasha Qudsieh*, Baasheer Nusairat, Doug Smith, John Brake Poultry Science Department, North Carolina State University, Raleigh, NC

The objective of this investigation was to determine the effect of zinc (Zn), copper (Cu), and Roxarsone (As) supplementation on cook yield, Warner-Bratzler (WB) shear values (kg shear), and CIE L* a* b* color of raw and cooked broiler breast fillets. 1024 Ross 708 male and female broilers were raised sex separate and fed 1 of 8 diet series in a 2 x 2 x 2 x 2 x 2 randomized complete block design with a factorial arrangement of Zn x Cu x As x gender. Diets contained (as mg/kg diet): Zn 120 or 240; Cu 10 or 100; and As 0 or 0.5. At 56 d of age, 2 birds per pen were randomly selected and processed. Deboned breast fillets were weighed, cooked to an internal temperature of 75 C, and reweighed to determine cook yield. Raw breast fillet yield was not affected by either Zn or As. However, Cu 100 reduced raw breast fillet yield in males by 1.3%. Cook yield was lower in females versus males (68.1 vs. 70.6%, respectively). Zn 240 decreased WB shear (3.6 kg) versus Zn 120 (4.1 kg). However, As 0.5 resulted in higher WB shear (4.27 vs. 3.46 kg). Females exhibited lower WB shear as compared to males (3.6 vs. 4.1 kg, respectively). Cu 100 decreased WB shear in females as compared to males (3.5 vs. 4.4 kg, respectively). Raw fillets from females were lighter (52.4 vs. 49.6), less red (1.4 vs. 1.9), and more yellow (6.8 vs. 5.7) than males. Cooked fillets from females were lighter (84.5 vs. 83.2), but there was no gender difference for redness or yellowness. Zn did not affect color of raw or cooked fillets. Cu 100 reduced redness in raw but not cooked fillets. As 0.5 reduced redness of cooked fillets. Cu 100 and As 0.5 increased yellowness of raw and cooked fillets. Results indicated that mineral supplementation and gender affected broiler breast muscle quality

Key Words: Broilers, Zinc, Copper, Roxarsone, Breast meat quality

M53 EFFECT OF DIFFERENT PROCESSING TECHNIQUES ON PROTEIN QUALITY OF HATCHERY WASTE MEALS ATHAR MAHMUD Department of Poultry Production, University of Veterinary and Animal Sciences, Lahore, Pakistan

In two experiments, the nutrient composition and protein quality of hatchery waste was evaluated by using different processing techniques i.e., cooking, autoclaving and extrusion. The protein contents of the cooked, autoclaved and extruded hatchery waste meals were 43.67, 44.10, and 41.64%, respectively. Microbial analysis of the raw HW ex-
M54 Efficacy assessment of omega-3 bio-fortified-eggs against hypercholesterolemia in human subjects  Zafar Hayat, Hussnain Rasul, Muhammad Nasir 1Department of Animal Sciences, University College of Agriculture, University of Sargodha, Sargodha, Pakistan 2Department of Food & Nutrition, University of Veterinary & Animal Sciences, Lahore, Pakistan

Omega-3 polyunsaturated fatty acids including alpha linolenic acid (ALA), eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) might reduce risk factors for heart disease through lowering total blood cholesterol, low density lipoprotein, blood pressure, triglycerides and enhancing the level of blood high density lipoprotein. Omega-3 bio-fortified eggs are excellent source of these vital nutrients. The objective of present study was therefore, to assess efficacy of omega-3 bio-fortified-eggs against hypercholesterolemia in human subjects. Twenty-two hypercholesteremia (cholesterol level > 200mg/dl) adult subjects of both sexes were recruited after informed consent, divided into two groups having 11 in each group. Group “A” was control and kept normal diet without eggs. Group “B” was provided with bio-fortified eggs one egg per day in morning for 5 weeks. The blood samples of the individuals were obtained at the start of the study, after this blood sample was obtained only weekly basis for 5 weeks. The blood was analyzed for blood lipid profile to assess the impact of omega-3 bio-fortified eggs against various blood lipid fractions. Omega-3 polyunsaturated fatty acid bio-fortified eggs improved the lipid profile in hypercholesteremic humans. The bio-fortified eggs decreased blood serum total cholesterol (mg/dl) in 5 weeks in subjects as compared to control group. The cholesterol level in first two weeks remained non-significant but afterwards it decreased significantly as compared to control in 3rd & 4th week. During last week cholesterol did not further decrease in bio-fortified group. Serum triglycerides level (mg/dl) were noted to be somewhat more in bio-fortified group, however, after 2nd week triglycerides started decreasing and mean TG concentration in biofortified group at the end of 5th week was less than control. There was variable but non-significant results for HDL level (mg/dl) in bio-fortified group compared to control group. The serum LDL levels (mg/dl) decreased significantly in bio-fortified group and followed the cholesterol pattern.

Key Words: Omega-3, Eggs, Cholesterol, Triglycerides, Human

M54 Listeria monocytogenes from slaughter plant to fully cooked product - sources, sites and potential intervention Mark Berrang USDA-ARS Russell Research Center, Athens, GA

Listeria monocytogenes is a human pathogen that has been associated with fully cooked poultry products. This organism is not highly prevalent on live broilers; however, prevalence tends to increase as carcasses proceed through an initial processing plant. In one study we found no L. monocytogenes on pre-scald carcasses but when we examined deboned thighs from the same flock, 4% were positive. Even a low percentage of positive cut up chicken parts translates to a substantial number when one considers the vast numbers of parts moved from a slaughter plant to a large commercial cooking operation. We have documented raw poultry meat as the most important source of L. monocytogenes to commercial cooking facilities. Once a cooking plant has been exposed, some subtypes of L. monocytogenes can colonize the plant and become long term residents in floor drains. Floor drain contamination is a concern because we have found that Listeria can become airborne when a hose is sprayed into a drain during wash down. Aerosolized Listeria can result in the contamination of product in either a slaughter plant prior to shipment or ready-to-eat product that has been fully cooked. Therefore, interventions are needed to control L. monocytogenes before it can be transferred from a slaughter plant to a cooking plant on raw product. In studies involving floor drains, we found that sanitizers, especially peroxide based chemicals, can effectively lower the numbers of L. monocytogenes both in floor drain liquid and attached to the inner surfaces of the drain pipe as a biofilm. In some cases adding a physical disruption such as ultra-sound may help to breakup biofilm architecture making chemical treatment more effective. Another approach is to lower numbers of L. monocytogenes on cut up broiler parts prior to packing for transport to a cooking plant. We have found that germicidal ultraviolet light shows promise as a means to significantly lower numbers of Listeria on raw product. Currently, work is being conducted to further optimize potential interventions and better understand the microbial ecology of human pathogens in poultry processing environments.

Key Words: Listeria monocytogenes, Poultry products, UV light