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## Meat and Muscle Biology™

**Salmonella Contamination in Poultry—Are We Missing a Potential Vector?**

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**Objectives**

In the third quarter of 2015, USDA *Salmonella* prevalence in young chicken carcasses and chicken parts was 1.4 and 22.1%, respectively. These data indicate that efforts to control carcass contamination are effective; however, the relatively high prevalence in chicken parts suggests the pathogen is somehow evading carcass decontamination strategies. Thus, the objectives of this study were to assess the presence of *Salmonella enterica* in an alternative carcass location, namely joint synovial fluid, and further, to characterize any recovered *Salmonella* isolates.

**Materials and Methods**

The synovial fluid of 3 unique true joints (shoulder, coxofemoral, and stifle) of 500 broiler carcasses were individually sampled (1500 total samples) and analyzed for *Salmonella* presence. Broiler carcasses were collected immediately post chilling from 3 conventional and 2 antibiotic free broiler processing facilities located in the Southeast and Western United States. Each processing location was sampled twice during the study period. Broiler carcasses were subjected to a decontamination protocol to reduce the potential of cross-contamination of the joint synovial fluid from the carcass surface. The decontamination protocol included immersing the carcass in ethanol, flame sterilization, removing the carcass skin around the joint to be sampled and finally, immersion in boiling water (10 s). The joints to be sampled were then aseptically exposed using a sterile scalpel. The synovial fluid of the 3 joints was individually sampled, using a sterile swab, and the swab was enriched (35°C, 22 h) in buffered peptone water. Enriched synovial fluid samples from each bird ( $n = 3$  joints per bird) were composited and subjected to rapid-based PCR *Salmonella* detection. If

the composite sample was deemed a presumptive positive, the individual enriched synovial samples were further subjected to rapid based PCR *Salmonella* detection. Individual samples deemed a presumptive positive were subjected to secondary enrichment and selective agar plating (Brilliant Green Sulfa Agar and XLT4 Agar) to facilitate isolation of *Salmonella*. Presumptive *Salmonella* isolates were serotyped prior to determination of antimicrobial susceptibility.

**Results**

Overall, the prevalence of presumptive positive *Salmonella* among all joints for all birds was 0.47% (7 out of 1500 samples) with a 95% confidence interval of 0.20 to 1.00%. The prevalence of presumptive positive *Salmonella* among the antibiotic free and conventionally raised broilers was 0.17 and 0.67%, respectively. Among regions, presumptive positive *Salmonella* prevalence tended to be greater in the Southeast (0.83%) versus the Western region (0.22%). Among joint types, prevalence was greater in the shoulder joint (0.80%) when compared to the coxofemoral (0.40%) and stifle (0.20%) joints, respectively.

**Conclusion**

To our knowledge, no previous assessments of *Salmonella* in the synovial fluid of broilers exists. However, as the presence of *Salmonella* in ground poultry and poultry parts remains problematic, alternative vectors for *Salmonella* should be evaluated. These results suggest that *Salmonella* may be present in the synovial fluid of broilers. Although prevalence is relatively low, when extrapolated to the scale of broilers produced, this information provides valuable insight into potential poultry contamination pathways. Further evaluation of this pathway is warranted.