

The Effect of Herd Health on Microbial Contamination of Swine Carcasses at Processing and Potential Implications to Human Health

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The food animal veterinarian's responsibility involves production of healthy livestock for human consumption. Subclinical disease may produce lesions such as pleuritis, which may increase the probability of carcass contamination with human foodborne pathogens such as *Salmonella* or *Campylobacter*. However, data objectively quantifying the relationship between animal health and human health risk are lacking; acquisition of this field data is invaluable in elucidating this relationship and providing parameters for risk assessments. In this study we hypothesized that a healthier animal produces meat with reduced bacterial risk. We determined how fecal bacterial carcass contamination correlates with subclinical physical indicators of disease by evaluating slaughter pigs at a large processing plant eight times, with each run representing ~330 head. Carcasses were sampled at three points (skin pre-scald, pelvic and pleural cavities) during processing and were cultured for *Campylobacter*, *Salmonella*, *Enterobacteriaceae* (direct human foodborne pathogens), and *Enterococcus* (indicator of fecal contamination). Positive correlations were identified between bacterial contamination and pleuritis and fatigued pigs (respiratory distress, reluctance to move). Regression analysis showed that every 1% increase in pleuritis resulted in a 5% increase in pleural *Campylobacter* contamination and a 4.4% increase in pelvic *Enterococcus* contamination. This preliminary analysis suggests a quantifiable correlation between swine health and human health risk as measured by carcass contamination. Data such as these help define the role of the veterinarian in public health: animal management decisions on-farm, such as housing, antibiotic use, environment and veterinary care directly impact public health.

Biography:

Dr. Jean Brudvig graduated in May 2006 with her Doctor of Veterinary Medicine degree from Iowa State University and her Master of Public Health degree from the University of Iowa, one of the first veterinary students to participate in this concurrent program. She founded the Veterinary Public Health Club in the College of Veterinary Medicine at ISU and was an active leader in the group for her last two years of veterinary school. She worked for the Center for Food Security and Public Health at ISU for three years during veterinary school, where she developed educational materials for veterinary practitioners and the public regarding foreign animal diseases. During her senior year, Dr. Brudvig participated in the 6-week epidemiology elective for senior veterinary students at the Centers for Disease Control and Prevention in Atlanta, where she was assigned to the Greater Yellowstone Area to assist in assessing the amount of human *Brucella* exposure from wildlife and domestic animals. She is currently a post-doctoral research associate in the Veterinary Diagnostic and Production Animal Medicine department at ISU under Dr. Scott Hurd, an expert in risk assessment and *Salmonella* epidemiology. Dr. Brudvig actively participates in multiple research projects involving the human health risks of antimicrobial resistance due to agricultural use, and hopes to earn her PhD in Veterinary Microbiology or Pathology and enter academia.
