

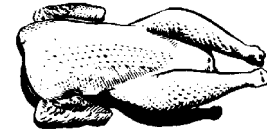


The University of Georgia

Cooperative Extension Service

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PROCESSING TIP...

SALMONELLA CONTAMINATION OF BROILER CARCASSES

Salmonellae contamination of uncooked poultry carcasses and cut-up parts continues to be of great concern to the industry because some of these microorganisms are pathogenic and can cause food borne illness. In addition, the USDA has established Pathogen Reduction Performance Standards of "acceptable" levels of Salmonella on raw poultry that all establishments must meet in order to remain in operation. It is generally thought that Salmonella contamination of carcasses during processing originates from bacteria that have colonized the birds ceca or intestinal tract. Another potential, but frequently overlooked source of contamination results from bacteria in the birds crop, which may be spread throughout the body cavity during processing. Crops may become contaminated during the feed withdrawal period prior to processing. During this feed withdrawal period, birds will consume anything available, including litter and feces which may harbor large numbers of bacteria.

Research has shown that crops are not only more likely than ceca to be contaminated with Salmonella, but they are also more likely than ceca to be ruptured during processing (rupture rate of 26% crops versus 0.3% ceca). Dr. B. M. Hargis and coworkers (1995) evaluated 3 flocks of broilers at a commercial processing plant for Salmonella positive crops and ceca (1100 total crops and 1000 total ceca). They found that the overall percentage of Salmonella positive crops and ceca were 52% and 15%, respectively. These researchers also tested the piston on the cropper for contamination after washing and immediately before entering the next bird to see if inadequate plant sanitation affected the number of Salmonella positive birds. They found that only 8 piston swabs out of 100 were positive for Salmonella after sanitation, and thus, cross contamination affect their results.

Additional research has shown that the length of time that broilers are held without feed before processing may affect Salmonella levels in the crop and ceca. Studies conducted at the USDA, Russell Research Center by Drs. Arthur Hinton and Jeff Buhr have shown that crops from full fed broilers have low pH (5.3), which minimizes the growth of pathogenic bacteria such as Salmonella. Length

PUTTING KNOWLEDGE TO WORK

The University of Georgia and Ft. Valley State College, the U.S. Department of Agriculture and counties of the state cooperating.
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of feed withdrawal did not change bacterial levels in the crop, but as length of feed withdrawal increased, the crops environment becomes more favorable for growth of bacteria. After 6 hours of feed withdrawal, crop pH increased to 6.6, which is more conducive for growth of pathogenic bacteria. Ceca from broilers held off feed 12 hours instead of 6 hours had over 100 times more pathogenic bacteria. Bacteria counts in the ceca continued to increase when feed withdrawal times exceeded 12 hours.

Conclusions and Observations:

1. Adequate plant sanitation is critical for preventing cross contamination.
2. The cropper may be a site of significant carcass contamination in the plant.

While holding birds off feed before processing will decrease the likelihood of carcass fecal contamination, extended feed withdrawal times may increase the number of pathogenic bacteria in the birds intestinal tract.

Figure 1: Enterobacteriaceae counts for broiler crops and ceca (Hinton et al., 1998; samples were stomached in 25 ml water, diluted, and analyzed.). Salmonella and E. coli are just two of the many species of bacteria found in the Enterobacteriaceae family.

Reference:

Hargis, B. M., D. J. Caldwell, R. L. Brewer, D. E. Carrier, and J. R. DeLoach, 1995. Evaluation of chicken crop as a source of Salmonella contamination for broiler carcasses. *Poultry Sci.* 74:1548-1552.

Hinton, A., Jr., R. Jeff Buhr, K. Ingram, 1998. Feed withdrawal and carcass microbiological counts. Presented at The Georgia Poultry Conference, September 30. Athens, Georgia.

Ramirez, G.A., L. L. Sarlin, D.J. Caldwell, C.R. Yezak, Jr., M.E. Hume, D. E. Corner, J. R. DeLoach, and B.M. Hargis, 1997. Effect of feed withdrawal on the incidence of Salmonella in the crops and ceca of market age broiler chickens. *Poultry Sci.* 76:654-656.

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Consult with your poultry company representative before making management changes.

“Your local County Extension Agent is a source of more information on this subject.”