

Comparison of the Isolation Rates and Characteristics of Salmonella Isolated from Antibiotic-Free and Conventional Chicken Meat Samples

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Abstract : Salmonella contamination in chicken samples can cause major health problems in humans. However, not only the effects of antibiotic treatment during growth but also the impacts of poultry slaughter line on the prevalence of Salmonella in final chicken meat sold to consumers are unknown. In this study, we compared the isolation rates and antimicrobial resistance of Salmonella between antibiotic-free, conventional, conventional Korean native retail chicken meat samples and clonal divergence of Salmonella isolates by multilocus sequence typing. In addition, the distribution of extended-spectrum β -lactamase (ESBL) genes in ESBL-producing Salmonella isolates was analyzed. A total of 72 retail chicken meat samples (n = 24 antibiotic-free broiler [AFB] chickens, n = 24 conventional broiler [CB] chickens, and n = 24 conventional Korean native [CK] chickens) were collected from local retail markets in Seoul, South Korea. The isolation rates of Salmonella were 66.6% in AFB chickens, 45.8% in CB chickens, and 25% in CK chickens. By analyzing the minimum inhibitory concentrations of β -lactam antibiotics with the disc-diffusion test, we found that 81.2% of Salmonella isolates from AFB chickens, 63.6% of isolates from CB chickens, and 50% of isolates from CK chickens were ESBL producers; all ESBL-positive isolates had the CTX-M-15 genotype. Interestingly, all ESBL-producing Salmonella were revealed as ST16 by multilocus sequence typing. In addition, all CTX-M-15-positive isolates had the genetic platform of blaCTX-M gene (IS26-ISEcp1-blaCTX-M-15-IS903), to the best of our knowledge, this is the first report in Salmonella around the world. The Salmonella ST33 strain (S. Hadar) isolated in this study has never been reported in South Korea. In conclusion, our findings showed that antibiotic-free retail chicken meat products were also largely contaminated with ESBL-producing Salmonella and that their ESBL genes and genetic platforms were the same as those isolated from conventional retail chicken meat products.

Keywords : antibiotic-free poultry, conventional poultry, multilocus sequence typing, extended-spectrum β -lactamase, antimicrobial resistance

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