

Analysis of Salmonella enterica serovar Enteritidis isolates from chickens and chicken meat products in Malaysia using PFGE, and MLST

ABSTRACT

Background: Salmonella is a very important foodborne pathogen causing illness in humans. The emergence of drug-resistant strains also constitutes a serious worry to global health and livestock productivity. This study investigated Salmonella isolates from chicken and chicken meat products using the phenotypic antimicrobial screening as well as the molecular characteristics of Salmonella isolates. Upon serotyping of the isolates, the antimicrobial susceptibility profiling using a panel of 9 commonly used antimicrobials was done. Subsequently, the molecular profiles of all the isolates were further determined using Pulsed Field Gel Electrophoresis (PFGE) and the Whole Genome Multi-Locus Sequence Type (wgMLST) analysis in order to obtain the sequence types. Results: The PFGE data was input into FPQuest software, and the dendrogram generated was studied for possible genetic relatedness among the isolates. All the isolates were found to belong to the Salmonella Enteritidis serotype with notable resistance to tetracycline, gentamycin, streptomycin, and sulfadimidine. The S. Enteritidis isolates tested predominantly subtyped into the ST11 and ST1925, which was found to be a single cell variant of ST11. The STs were found to occur in chicken meats, foods, and live chicken cloacal swabs, which may indicate the persistence of the bacteria in multiple foci. Conclusion: The data demonstrate the presence of S. Enteritidis among chickens, indicating its preference and reservoir status for enteric Salmonella pathogens.

Keyword: Salmonella Enteritidis; Chicken meat products; Pulse field gel electrophoresis; Multi-locus sequence typing; Whole-genome sequencing; Antimicrobial resistance