

Determination of Pathogenic Antibiotic-Resistant Bacteria from Chicken Meat

Muhamad Khairul Faizi bin Wahab^a, Maslinda Musa^{a,b*}

Structured Abstract

Background: Chicken meat is a crucial component of the human diet; however, it can also serve as a reservoir for harmful bacteria that have developed resistance towards antibiotics. Numerous scientific research supports the hypothesis of a relationship between the usage of antibiotics throughout agricultural production and human pathogens becoming antimicrobial resistant in which food is among the probable transfer routes. Humans may contract strains of antimicrobial resistant *Salmonella typhimurium* (*S. typhimurium*) from both pork and poultry meat. This study aims to investigate the presence of multidrug resistant bacteria found in chicken meat and to identify them through utilizing 16S rDNA sequencing. This study contributions acts as a framework for future research on the antibiotic-resistant profiles on bacteria found in chicken meat which could provide insight on which antibiotics farmers should use for their chickens. These findings could also provide researchers on the bacteria community found in chicken meat which could led to methods to limit these bacteria to prevent future cases of bacterial infection from the consumption of chicken meat.

Methods: Ten grams of chicken meat sample was cleaned, macerated, enriched in tryptic soy broth (TSB), incubated at 37 °C and 180 rpm for 18 hours. The sample was then streaked onto selective media, sub-cultured onto nutrient agar and then 0.5 MacFarland standard of bacterial suspension was prepared until the reading on spectrophotometer was between 0.08 and 0.1, equivalent to 1.5×10^8 CFU/ml and streaked onto MHA for antibiotic susceptibility testing. Genomic DNA of the isolates were then extracted then 16S rDNA were amplified through PCR and sequenced through Sanger sequencing.

Results: The results showed two isolates from chicken meat sample were resistant towards multiple drugs. Both isolate 1 and isolate 2 were shown to be resistant towards ceftazidime, oxacillin and tetracycline. However, due to time constraints, amplification of 16S rDNA of the isolates was not possible thus identifying the isolates through molecular method was not performed.

Conclusion: In conclusion, the findings of this study indicated the presence of multidrug resistant bacteria in chicken meat as isolates were shown to be resistant towards at least three antibiotics which were ceftazidime, oxacillin and tetracycline. However molecular methods such as PCR is required to accurately identify the isolates for correct prescription of antibiotics for patients infected with Multidrug resistant bacteria. These results highlight the importance of controlling the usage of antibiotics and avoiding overprescribing antibiotics to reduce the rise of antibiotic-resistant bacteria.

Keywords: Chicken meat, Antibiotic Resistance, *Salmonella typhimurium*, 16S rDNA, PCR

*Correspondence: maslinda64@uitm.edu.my

^a School of Biology, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia

^b Centre for Chemical Synthesis and Polymer Technology (CCSPT), Institute of Science, UiTM, Shah Alam 40450, Malaysia.