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Retail chicken carcasses as a reservoir of antimicrobial-resistant *Escherichia coli*

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Antibiotic resistance is one of the major public health challenges in both developed and developing countries. The development and spread of resistant bacteria have been linked to the misuse of antibiotics in human and animal populations. Moreover, the spread of resistance has been associated with the consumption of food contaminated with pathogenic and non-pathogenic resistant bacteria. There is limited information of antibiotic resistance contamination of raw chicken meat in Qatar. The objective of this study was to determine the prevalence of antibiotic resistance among local and imported chicken whole carcasses in Qatar. A total of 270 chicken carcasses locally-produced (chilled) and imported (chilled and frozen) were obtained from three different hypermarket stores in Qatar. A total of 216 Escherichia coli (E. coli) were isolated and subjected to antibiotic susceptibility testing using disc diffusion method. Furthermore, extended-spectrum β-lactamase (ESBL) production was determined via double disc synergetic test. In addition, isolates harboring colistin resistant was determined using multiplex-PCR and DNA sequencing. Nearly 89% (192/216) of the isolates were resistant to at least one of the 18 antibiotics. In general, isolates from local and imported chicken carcasses showed relatively higher resistance to sulfamethoxazole (62%), tetracycline (59.7%), ampicillin and trimethoprim (52.3%), ciprofloxacin (47.7%), cephalothin, colistin (31.9%) and gentamicin (15.7%). On the other hand, less resistance was recorded against amoxicillin/clavulanic acid (6%), cefuroxime (6.9%), ceftriaxone (5.1%), nitrofurantoin (4.2%) and piperacillin/tazobactam (4.2%), cefepime (2.3%), meropenem (1.4%), ertapenem (0.9%), fosfomycin (1.8%), and amikacin (0.9%). Nine isolates (4.2%) were ESBL producers. Furthermore, 63.4% (137/216) were multidrug resistant (MDR). The percentage of MDR, ESBL producers, and colistin-resistant isolates were significantly higher among local chilled isolates compared to imported chilled and frozen chicken samples. Our findings indicate high antibiotic resistant prevalence in chicken carcasses in Qatar, including ESBL, MDR and colistin resistance. Such resistant E. coli could potentially spread to humans through consumption of chicken meat. Development and implementation of a stewardship program to control and monitor the use of antibiotics in animal production locally and introduce testing of imported chicken for antibiotic resistance are needed in Qatar.

Biography

Nahla Omer Eltai has completed her PhD at Humboldt University, Berlin, Germany; Postdoctoral studies from University of the West of England, U K She is a Research Associate at Biomedical Research Centre, Qatar University, Qatar. She has published more than seven papers in the field of antibiotic resistance in reputed journals. Her research interests are multidisciplinary with emphasis on molecular diagnostic approaches, antimicrobial susceptibility and resistance, test of new natural antimicrobial agents. She is adopting the one health system approach by studding antimicrobial resistance in agriculture, environment and human.

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