

# INFECTIOUS DISEASES

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## Detection of the *mcr-1* colistin resistance gene and extended-spectrum beta-lactamase (ESBL)-producing *Escherichia coli* from poultry in Qatar

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Antimicrobial resistance (AMR) is a growing public health concern worldwide and is one of the top health challenges facing humanity in the 21<sup>st</sup> century. AMR among Enterobacteriaceae is rapidly increasing especially to third-generation cephalosporins and carbapenems. Further, strains carrying mobilized colistin resistance (*mcr*) genes 1 and 2 have been isolated from humans, food-producing animals, and environment. Uncontrolled use of antibiotics in animals in large scale could be one of the major contributing factors to generation and spread of antibiotic resistance. No studies have been done to evaluate antimicrobial resistance in animals in Qatar. This study aimed at establishing a primary baseline data for prevalence of antimicrobial resistance among food animals in Qatar. 172 fecal samples were obtained from two broiler farms and one live bird market in Qatar and 90 *Escherichia coli* (*E. coli*) bacteria were isolated and subjected to antimicrobial susceptibility testing using E-test method. 90% (81/90) of the isolates were resistant to at least one of the 16 tested antibiotics. 15.5% (14/90) of the isolates were colistin resistant, 2.2% (2/90) were extended spectrum  $\beta$  lactamase (ESBL) producers and similar percentages were multi-drug resistant (MDR) to four antibiotic classes. ESBL-producing *E. coli* and colistin resistant isolates were confirmed using double disc susceptibility testing and PCR, respectively. In summary, our results indicate that high antimicrobial resistance in food producing animals in Qatar, including ESBL and colistin resistance. Such AMR bacteria could be easily transmitted to humans through consumption of undercooked food or noncompliance with hygiene practices, which mandates prompt development and implementation of stewardship program to control and monitor the use of antimicrobial agents in community and agriculture.

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