Extended Abstract Journal of Food Microbiology 2019
Vol.3 No.2

Applied Microbiology 2019: Retail chicken carcasses as a reservoir of antimicrobial - resistant *Escherichia coli*- Nahla Omer Eltai- Qatar University

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Antibiotic resistance is one of the major challenges for public health in developed and developing countries alike. The development and spread of resistant bacteria have been linked to misuse of antibiotics in populations of humans and animals. In addition, the spread of resistance has been related to food intake contaminated with pathogenic and non-pathogenic resistant bacteria. There is scant information about contamination of raw chicken meat with antibiotic resistance in Qatar. The goal of this study was to determine the prevalence of antibiotic resistance in Qatar among whole carcasses of the local and imported chicken. A total of 270 chicken carcasses were obtained from three different hypermarket stores in Qatar, both locally produced (chilled) and imported (chilled and frozen). A total of 216 *Escherichia coli* (*E. coli*) have been isolated and tested for antibiotic resistance using the process of diffusion of disks. Additionally, the production of extended-spectrum β-lactamase (ESBL) was determined through a double-disk synergetic test. Additionally, multiplex-PCR and DNA sequencing was used to determine isolates that harbor colistin resistant. Nearly 89 per cent of the isolates (192/216) were resistant to at least one of the 18 antibiotics. Generally speaking, 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%), respectively. On the other hand, less resistance was observed to amoxicillin / clavulanic acid (6%), cefuroxime (6.9%), ceftriaxone (5.1%), nitrofurantoin (4.2%), piperacillin / tazobactam (4.2%), cefepime (2.3%), meropenem (1.4%), ertapenem (0.9%), fosfomycin (1.8%), and amikacin (0.9%). ESBL producers were nine isolates (4.2 per cent). In addition, 63.4 per cent (137/216) were resistant to multidrugs (MDR). Compared to imported chilled and frozen chicken samples, the percentage of MDR, ESBL producers and colistin-resistant isolates was significantly higher among local chilled insulates. Our findings show high prevalence of antibiotic resistance in chicken carcasses in Qatar including resistance to ESBL, MDR and colistin. Such rugged *E. Coli* could potentially spread to humans through chicken meat consumption. In Qatar it is important to establish and enforce a stewardship system to regulate and track the use of antibiotics locally in animal production and to introduce testing of imported chicken for antibiotic resistance.

Resistant strains from the gut are readily infected with soil poultry carcasses at slaughter and as a consequence poultry meat are also infected with multiresistant *E. Coli*; during laying even eggs are infected. Hence faecal resistant E. Poultry *coli* can infect humans, either directly or through food. These resistant bacteria can colonize the human intestinal tract and can also contribute genes of resistance to endogenous flora in humans. Others, by comparison, have suggested that isolates of humans and poultry belong to two distinct pools of resistant *E. Coli*. *Coli*. Animal serotyped, and human *E. Coli* insulates with an antisera 150 O. 289 (36 percent) of 798 animal strains could be serotyped, whereas only two of 1580 human isolates could not be typed. The prevalence of resistance in faecal E is given in this study. The following populations analyzed *coli*: broilers and turkeys, both with relatively high use of antibiotics, and laying hens with relatively low use of antibiotics. For research potential spread of resistant E. Farmers participating in the study were also required to submit faecal samples of *coli* or resistance genes from those poultry populations to humans. Also studied has been the faecal flora of turkey and poultry slaughterers. Farmers are in daily contact with their animals and are directly exposed to animal feces, and slaughterers have daily contact with carcasses or meat from the poultry. In terms of prevalence and degree of resistance in E, all faecal samples were analyzed. *Coli. Coli*.

One E. Colony was selected randomly from each faecal sample from the antibiotic-free control plate for antibiotic susceptibility testing using the Iso-Sensitest inoculum dilution method of 5 × 105 cfu / mL. The antimicrobial agents tested and resistance breakpoints were mainly based on the recommendations of the Dutch Antimicrobial Susceptibility Testing Working Group as follows: amoxycillin (16 mg / L), chloramphenicol (16 mg / L), ciprofloxacin (4 mg / L), flumequin (8 mg / L), gentamicin (8 mg / L), neomycin (16 mg / L), nitrofurantoin (64 mg / L), oxytetracycline (16 mg / L), streptomycin (32 mg / L), *E. coli* ATCC 25922 was used as reference strain.

No E in approximately 10% of human and animal samples. *Coli* grew on the antibiotic-free control plate, which means less than 300 cfu of E. Coli (minimum level of detection) was present per gram of faeces. Testing the antibiotic susceptibility of the *E. Coli* isolates showed resistance to five or more antibiotics, with the highest frequency in turkey isolates (32 per cent) , followed by broilers (23 per cent) and broiler farmers (22 per cent) as shown in Table II. The majority of laying hen and laying hen isolates were susceptible to all compounds tested (65 per cent and 55 per cent, respectively). These percentages were significantly lower for turkey and broiler isolates (16 and 20 percent, respectively). The most common pattern in laying hen farmers, i.e. resistance to streptomycin and sulphamethoxazole, was not found among laying hen isolates. Resistance patterns in turkeys corresponded to those in turkey farmers and slaughterers, and in general the resistance patterns in broiler farmers and slaughterers were also present. No resistance to ciprofloxacin was observed in these single isolates of E. Oh, *coli*.

This work is partly presented at 6th World Congress and Expo on Applied Microbiology October on 21-22, 2019 held at Rome, Italy