ANTIMICROBIAL RESISTANCE PROFILES IN ESCHERICHIA COLI ISOLATED FROM WHOLE-CHICKEN CARCASSES FROM CONVENTIONAL, ANTIBIOTIC-FREE AND ORGANIC REARING SYSTEMS

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RESUMO

The increase and dissemination of antimicrobial resistant bacteria are considered a global public health problem. The indiscriminate use of antimicrobials in humans, animal production, and agriculture are often cited as a possible cause of it. Proposed solutions can range from banning the use of antimicrobials important for human health in animals to the adoption of alternative farming systems. Studies available on the impact of these measures on foodstuffs originated from farming systems with restrictions on the use of antimicrobials are still scarce. In this sense, the aim of this study was to assess antimicrobial resistance in generic *Escherichia coli* isolated from whole-chicken originated from farming systems with and without restrictions in the use of antimicrobials. For this purpose, 24 whole-chicken units packaged in the industry were conventionally purchased in the retail market and allocated into three groups: chickens raised with antimicrobials administration (GC); those raised free of antibiotics (GL), and chickens from organic system (GO). Whole-chicken units were individually rinsed as recommended by ISO 17604: 2015 and *E. coli* was isolated from the rinse suspension. To evaluate the resistance profile, 216 strains of *E. coli*, equally distributed among the three groups, were tested against 12 antimicrobials by the broth microdilution or disk diffusion tests. Highest frequencies of resistance were observed against tetracycline (32.4%), trimethoprim (28.2%), ampicillin (25.0%), and nalidixic acid (18.5%). Looking at the groups, the percentage of resistance to tetracycline was 37%, 35%, and 25% for GC, GL, and GO, respectively. All strains were susceptible to colistin, meropenem, and tigecycline. Eighty strains (40.7%) were fully susceptible to the tested antimicrobials and 23.6% were multidrug-resistant. A Poisson regression model, adopting GC as the reference category, showed prevalence ratios (PR) of 0.7 (95% CI 0.4 – 1.2) and 0.5 (0,28 – 0.96) for multidrug-resistance in GL and GO, respectively. For fully susceptibility, PR were 1 (0.63 – 1.58), for GL, and 1.67 (1.13 – 2.45), for GO. These observations indicate that, despite resistant bacteria are present in the three researched groups, lower selection pressure of antimicrobial used in the farming system may reflected the resistance profile of bacteria carried in foodstuffs purchased by the consumer.

PALAVRAS-CHAVE: Antimicrobial resistance, Escherichia coli, broiler, organic poultry production, One Health

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