Phenotypic antimicrobial susceptibility of E. coli from raw meat, ready-to-eat meat and its related samples in one health context

ABSTRACT

Meat is an important food source that can provide a significant amount of protein for human development. The occurrence of bacteria that are resistant to antimicrobials in meat poses a public health risk. This study evaluated the occurrence and antimicrobial resistance of *E. coli* (*Escherichia coli*) isolated from raw meats, ready-to-eat (RTE) meats and their related samples in Ghana. *E. coli* was isolated using the USA-FDA Bacteriological Analytical Manual and phenotypic antimicrobial susceptibility test was performed by the disk diffusion method. Of the 200 examined meats and their related samples, 38% were positive for *E. coli*. Notably, *E. coli* was highest in raw beef (80%) and lowest in RTE pork (0%). The 45 *E. coli* isolates were resistant ≥ 50% to amoxicillin, trimethoprim and tetracycline. They were susceptible to azithromycin (87.1%), chloramphenicol (81.3%), imipenem (74.8%), gentamicin (72.0%) and ciprofloxacin (69.5%). A relatively high intermediate resistance of 33.0% was observed for ceftriaxone. *E. coli* from raw meats, RTE meats, hands of meat sellers and working tools showed some differences and similarities in their phenotypic antimicrobial resistance patterns. Half (51.1%) of the *E. coli* isolates exhibited multidrug resistance. The *E. coli* isolates showed twenty-two different resistant patterns, with a multiple antibiotic resistance index of 0.0 to 0.7. The resistant pattern amoxicillin (A, *n* = 6 isolates) and amoxicillin-trimethoprim (A-TM, *n* = 6 isolates) were the most common. This study documents that raw meats, RTE meats and their related samples in Ghana are potential sources of antimicrobial-resistant *E. coli* and pose a risk for the transfer of resistant bacteria to the food chain, environment and humans.