Antimicrobial Resistance Profiles of Selected *Enterobacteriaceae* Contaminating Raw Beef from Retail Butcheries in Kakamega Town, Kenya

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Abstract

Meat has been the main source of protein foodstuff globally since ancient times to date. However, it should not habour disease causing agents. Its high nutritive value has been found to hasten microbial growth. To determine antimicrobial resistance profiles of selected Enterobacteriaceae (*E. coli*, *Shigella sp.* and *Salmonella sp*.) isolates from raw beef samples.

***Design*:** This was a cross-sectional study to determine antimicrobial resistance profiles of bacteria isolated from raw beef using disk diffusion, minimum inhibitory and bactericidal concentrations methods. Further, the determination of their ability to form biofilms in the presence of commonly used antibiotics was deduced. Statistical analysis techniques such as descriptive statistics and chi-square test of homogeneity were used for data analysis. Raw beef samples were obtained from selected 54 retail butcheries in Kakamega town, Kenya and laboratory analysis of samples was done at Masinde Muliro University microbiology laboratory. Out of the 1296 samples collected, 548/1296(42.3%) were contaminated with *E. coli,* 80/1296(6.17%) with *Salmonella sp.* and 20/1296(1.54%) with *Shigella* spp. Among the 548 *E. coli* strains sensitivity to quinolones differed (nalidixic acid-486/548 and ciprofloxacin- 535/548), and all the strains were sensitive to chloramphenicol and ceftriaxone, 72.6% of the

E. coli isolates were sensitive to gentamicin, 21% to streptomycin, and 89% to kanamycin. About, 70 (87.5%) strains of *Salmonella* species isolated were sensitive to all the drugs though some [10 (12.5%)] were resistant to cotrimoxazole, ciprofloxacin and nalidixic acid. All the 20(100.0%) isolates of *Shigella sp*, were sensitive to all the drugs tested in this study. Raw beef samples were found to be contaminated with enterobacteriaceae. *E. coli* was the main contaminant isolated,

also major antimicrobial resistant isolate. The study recommends stringent hygiene measures on butcheries and personnel handling meat.

Keywords: Contamination, Antimicrobial, *Escherichia coli*, *Shigella sp.*, *Salmonella sp.*, beef, Microbial.