

High presence of CTX-M-2-producing *Escherichia coli* in chicken meat obtained from butcher shops in La Plata City, Argentina

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INTRODUCTION

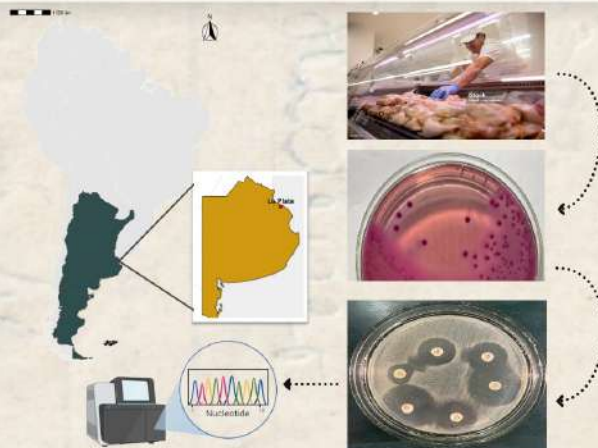
Global widespread extended-spectrum β -lactamase (ESBL)-producing *Escherichia coli* poses a significant threat in human healthcare and community settings. Chicken meat may be one of the critical transmission routes for those bacteria in the community.

MATERIALS AND METHODS

Between 2023 and 2024, a total of 92 chicken meat samples were collected from 46 butcher shops in La Plata city, Buenos Aires, Argentina randomly selected. Briefly, 25 g of each sample was mixed with 225 mL of buffered peptone water followed by incubation overnight at 37 °C. Enriched cultures were inoculated on Mac Conkey agar plates supplemented with 4 ug/ml of cefotaxime. One colony was picked per plate. Antimicrobial susceptibility test was assessed by disc diffusion method according to CLSI M100ED34. Cefotaxime resistant- *E. coli* was sequenced using Illumina NovaSeq 6000 (Illumina, San Diego, USA). Finally, whole genome sequences were analysed on Galaxy platform version 24.2.

OBJETIVE

To characterize ESBL-producing *E. coli* isolated from chicken meat obtained from butcher shops in La Plata city, Buenos Aires, Argentina.



RESULTS

Of all butcheries and chicken meat samples, 93.5 % and 78 % were positive to at least one ESBL-producing *E. coli* respectively. In total, 72 ESBL-producing *E. coli* were obtained.

Figure 1. Percentage of ESBL-producing *E. coli* resistant to different antimicrobial agents



AMP: ampicillin, AMC: amoxicillin/clavulanic acid, CTX: cefotaxime, CAZ: ceftazidime, FEP: cefepime, FOX: cefoxitin, MER: meropenem, IMI: imipenem, GEN: gentamicin, AMK: amikacin, CIP: ciprofloxacin, TMS: trimethoprim-sulfamethoxazole, FOS: fosfomicin, NIT: nitrofurantoin, CLO: chloramphenicol, TET: tetracycline

Shown multidrug resistance in 93 % of ESBL resistant-*E. coli*. Resistance profile frequently observed was: AMP, CTX, CIP, TMS, FOS, TET.

All isolates were sensitive to carbapenems and colistin. ESBL-producing *E. coli* were multidrug-resistant (MDR).

Figure 2. Distribution of *bla*_{CTX-M} genes groups

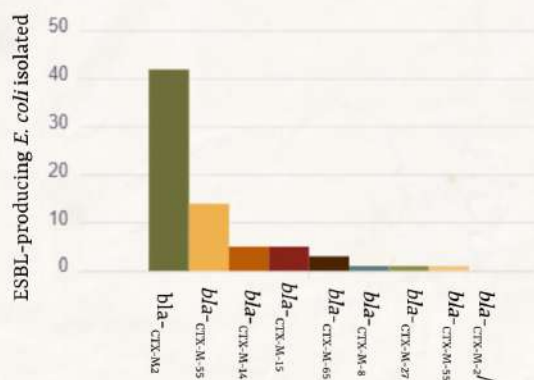


Figure 3. Co-occurrence of resistance genes in *E. coli* strains

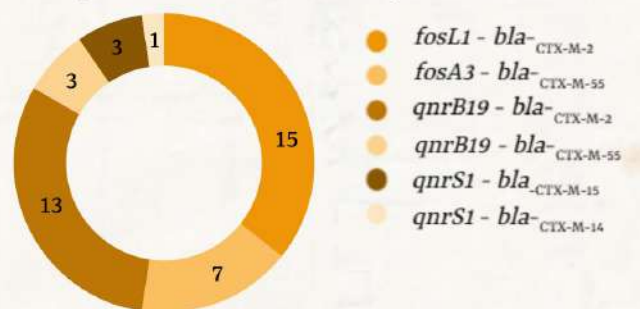
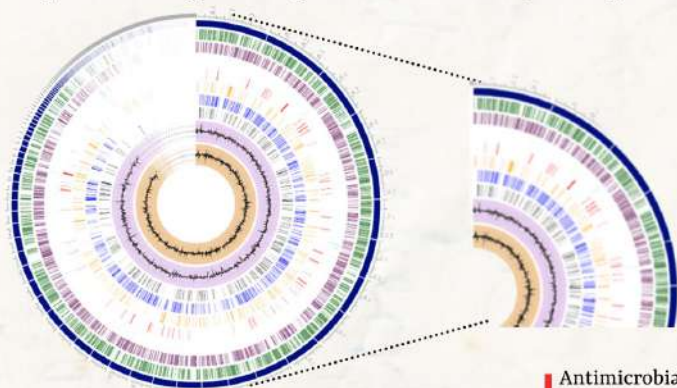


Figure 4. Circular genome diagram of one of the ESBL-producing *E. coli*



This analysis was performed by the BV-BRC program

Fourteen *E. coli* harbour genes confer resistance to all three HPCIA: cefotaxime, fosfomicin and fluoroquinolones.

CONCLUSION

Our results show a high circulation of ESBL-producing *E. coli*, resistant to "Highest Priority Critically Important Antimicrobials" (HPCIA) that belong to CTX-M groups predominant in poultry and humans in Argentina. Future studies will be necessary to determine the origin of contamination of chicken meat within the production chain. The information obtained supports the promotion of measures that allow the implementation of strategies for the correct handling of food and prevent its transmission to humans.