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*Towards
the veterinary
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Main topic : Antimicrobial resistance: A worldwide concern

DETECTION OF MULTIRESTANT E. COLI IN RAW MEAT IN SOUTH ITALY

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INTRODUCTION: The latest European Report on AMR continues to provide extremely worrying data: over 33,000 deaths a year associated with antimicrobial resistant infections.

Antimicrobial resistance (AMR) is a global challenge and a priority for the European Union. *Escherichia coli* is used to assess the hygienic quality of food products and the dissemination of antimicrobial resistance. The purpose of this study was to investigate the distribution of antibiotic-resistance in meat-borne *E. coli*.

MATERIAL AND METHODS: The study was carried out on 570 samples of raw meat (poultry, turkey, sheep, goat and cattle), collected from retail markets in Apulia and Basilicata (Southern Italy) in 2018-2020. The susceptibility profiles were assessed on *E. coli* isolated from these samples, in accordance with the Commission Implementing Decision (EU) 2020/1729. All isolates were tested using the minimum inhibitory concentration (MIC) method and the microdilution method for colistin. The results were interpreted according to latest EUCAST guidelines.

A multiplex PCR (*mcr-1*, *mcr-2*, *mcr-3*, *mcr-4*, *mcr-5*) was performed according to the protocol of the EURL-AR. Positive *mcr-1* strains were sent to the EURL-AR for molecular characterization by Whole genome sequencing (WGS).

RESULTS: In this study, 147 *E. coli* strains were isolated from 570 samples and 25.8% was multidrug-resistant (MDR). *E. coli* strains were isolated from 56 chicken (38%), 41 turkey (27.9%), 21 sheep (14.3%), 17 bovine (11.6%) and 12 from pork (8.2%). The antimicrobials most often represented in the isolates were: tetracycline (50.3%), ampicillin (40.1%), ciprofloxacin (39.5%), trimethoprim (36.7%), chloramphenicol (26.5%) and sulfamethoxazole (26.5%). 5 (3.4%) strains were found to be resistant to meropenem, 9 (6.1%) to cefotaxime and 5 (3.4%) to ceftazidime. Two out of 147 *E. coli* isolates showed resistance to colistin (MIC \geq 4 mg/L) confirmed by the presence of the *mcr* gene. Only one strain susceptible to colistin (MIC 0.25 mg/L), showed the presence of the *mcr* gene. The three strains were isolated from turkey meat and showed the presence of *mcr-1* gene. All other strains were susceptible to colistin. The results of WGS obtained showed that the three *E. coli* strains were genetically different as demonstrated by the fact that they belonged to 3 different multilocus sequences, different plasmid replicons and antimicrobial resistance genes.

CONCLUSIONS: The results of the antimicrobial resistance study comply with European data, showing high resistance to quinolones, tetracyclines, ampicillin and trimethoprim, and low resistance to colistin, 3rd-generation cephalosporins and carbapenems. Multi drug resistances were assessed in 29% of isolates, often including critically important antibiotics. These results highlight that more studies and actions are needed to manage the use of antibiotics.