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the veterinary  
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future

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.