# Investigation of multidrug-resistant enteric bacteria in pigs produced for human consumption – Is there a risk for Public Health?

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**Objectives:** Many foodborne illnesses that affect humans are caused by infectious agents that can be transmitted from animals to humans. These agents can be found in the feces of farm animals and contaminated meat, posing a significant public health concern. This study aims to identify and to characterize *Escherichia coli*, *Salmonella* spp., *Shigella* spp., and *Yersinia enterocolitica* strains from feces (n=84) and meat (n=25) of pigs processed for human consumption, both phenotypically and genotypically.

**Material and methods:** Fecal samples were collected from various slaughterhouses, while meat samples were purchased randomly from retail stores of both Lisbon area and the central region of Portugal. After bacteria isolation using non- and selective media, 92 isolates of *E. coli* and 4 isolates of *Y. enterocolitica* were obtained. These isolates were studied for antimicrobial susceptibility using the disk diffusion method and interpreted according to EUCAST guidelines. Isolates were further genomically characterized through whole-genome sequencing.

**Results:** In this study, *E. coli* was found in 28% of meat samples and all fecal samples. Shiga toxin-producing *E. coli* (STEC) and enteropathogenic *E. coli* (EPEC) were present in 1.2% of fecal samples. Moreover, *Y. enterocolitica* was identified in 4% of meat samples and 3.6% of fecal samples. Bacterial resistance was observed in 77.7% of *E. coli* isolates (40% were multi-resistant) and all *Y. enterocolitica* isolates from fecal samples. Most isolates were resistant to tetracycline, ampicillin, trimethoprim-sulfamethoxazole and chloramphenicol. Additionally, the sequenced *E. coli* isolates exhibited extraintestinal pathogenic *E. coli* virulence genes, with *csgA* and *fimH* being the most common.

**Conclusion:** The identification of pathogenic *E. coli* and *Y. enterocolitica*, including multi-resistant strains, in pig feces and meat underscores their potential as sources of transmission to humans. Adopting a One Health approach is crucial for detecting and managing foodborne illnesses.

**Keywords:** Enteric bacteria, Pigs, Antimicrobial resistance, Whole-genome sequencing, Public Health.