

**TITLE:** TRACKING OF THE CONTAMINATION BY *YERSINIA ENTEROCOLITICA* IN THE PORK PRODUCTION CHAIN

**AUTHORS:** MARTINS, B. T. F.; GROSSI, J. L.; CAMPOS-GALVÃO, M. E. M.; YAMATOGLI, R. S.; NERO, L.A.

**INSTITUTION:** UNIVERSIDADE FEDERAL DE VIÇOSA, DEPARTAMENTO DE VETERINÁRIA, VIÇOSA, MG (AVENIDA PETER HENRY ROLFS, CEP 36570-900, VIÇOSA – MG, BRAZIL)

**ABSTRACT:**

Pork is the main animal origin protein consumed around the world. *Yersinia enterocolitica* is a relevant foodborne pathogen in pork products, once pigs are reservoirs of this pathogen. *Y. enterocolitica* is responsible for human yersiniosis, a gastroenteritis that causes acute diarrhea and fever (especially in children), abdominal pain, acute mesenteric lymphadenitis, mimicking appendicitis. This study aimed to track the contamination sources of *Y. enterocolitica* in a pork production chain, and to characterize the pathogenic potential and antimicrobial resistance profiles of isolates. Samples from different steps of pork production (environment, carcasses, palatine tonsils, mesenteric lymph nodes, utensils, equipment, and end products; n = 870) were obtained from two finishing pig farms and one slaughterhouse located in Minas Gerais, Brazil. Samples were subjected to *Y. enterocolitica* detection, and the obtained isolates were subjected to phenotypical and molecular analysis for identification and serotyping. *Y. enterocolitica* isolates were subjected to *Xba*I macrorestriction and pulsed field gel electrophoresis (PFGE), PCR to detect virulence related genes, and to *breakpoint* and PCR to characterize their antimicrobial resistance profiles against 17 antibiotics. *Y. enterocolitica* was isolated in 8 samples, specifically palatine tonsils (5), mesenteric lymph nodes (2) and carcasses after bleeding (1), and 16 isolates were obtained. All isolates were identified as belonging to bio-serotype 4/O:3, associated to various yersiniosis cases and outbreaks around the world. PFGE demonstrated 60 to 80% identify indexes among isolates, and allowed the identification of palatine tonsils as relevant contamination sources in the pork production chain. The isolates presented different virulence related genes, demonstrating the pathogenic potential of *Y. enterocolitica*. All isolates presented high frequencies of antimicrobial resistance, despite the presence of *emrD*, *yfhD* and *marC*, related to multi-drug resistance. Only ciprofloxacin and kanamycin were effective against all isolates. The present study demonstrated the relevance of pigs in the distribution of *Y. enterocolitica* in the pork production chain, highlighting the need for proper control of contamination and tracking of this foodborne pathogen in the initial steps of production, what must be conducted with the support for available tools to assure the quality and safety of pork products.

**Keywords:** *Yersinia enterocolitica*, tracking, virulence, PFGE, antimicrobials

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