

TITLE: HIGH PREVALENCE OF *mcr-1* GENE IN *E. COLI* FROM SWINE ASSOCIATED TO COLISTIN USE.

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Abstract:

Brazil has an important role in swine production being the 4th world's major producer and exporter. In order to improve sanitary status and control bacterial infections on farms, the industry routinely uses antimicrobials throughout the production cycle. The exposure to antibiotics such as Colistin leads to a selection of resistant bacteria in the environment, which may reduce treatment options of the human and animal infections. In this context, the emergence of polymyxin resistance, mediated by a transferable plasmid gene *mcr-1*, has caused great concern due to the possibility of dissemination among different species of *Enterobacterales*. Thus, the aim of this study was to determine the prevalence of the *mcr-1* gene in *E. coli* isolates from swine and to correlate with the antimicrobials provide to animals. 38 *E. coli* isolates were collected from rectal swabs belonging to the 18 different farms (18 batches) between March and September, 2018. These isolates were submitted to multiplex real time PCR with high-resolution melting (RT-PCR-HRM) to *mcr-1* gene. The susceptibility profile of the positive isolates was performed by disk diffusion and MIC of colistin performed by microdilution broth. The results were interpreted according to the CLSI and BrCAST respectively. Prevalence of *mcr-1* gene was 29% (11/38) found in 9 distinct farms. Regarding the profile of antimicrobial susceptibility, 90% (10/11) of the isolates were considered multidrug resistant. All strains were resistant to tetracycline and 90% (10/11) to enrofloxacin. Nine isolates (9/11) were considered resistant to colistin (MIC = 4 µg / mL). According to animals health bulletin, all (9) batches received colistin and amoxicillin and 89% (8/9) received fluoroquinolones. The phenotypic resistance detected was directly related to previous exposure of the animal to antimicrobials. The high prevalence of *mcr-1* associated with elevated levels of resistance evidences the need of a major control and surveillance program of antibiotic use in veterinary. Human health along with the environment can be directly impacted by this practice, leading to the exhaustion of therapeutic options. Considering its threat for the public health, the implementation of the One Health strategy over multidisciplinary initiatives should be continuously discussed and alternatives to the use of antimicrobials in animal production should be implemented.

Keywords: *mcr-1*; colistin resistance; pig; One health; PCR

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