# High Prevalence of Streptomycin Resistance among *Escherichia coli* Isolated from Chicken and Pig Feces

Chengjun Pu, Liquan Liu, Ying Sun

College of Resources and Environmental Sciences, China Agricultural University, Beijing 100193, China
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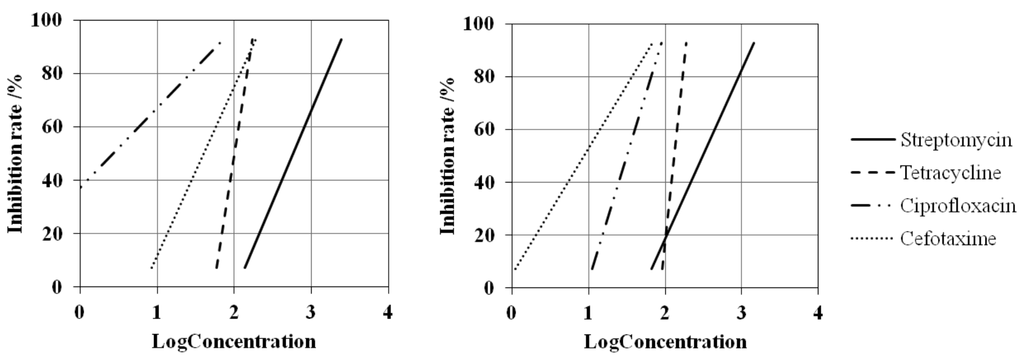
Presenting author email: sunying@cau.edu.cn

**Abstract:** Streptomycin is widely used in livestock farms. However, there is a lack of concern in streptomycin resistance among *Escherichia coli (E. coli)* isolated from chicken and pig feces. In this study, we determined minimum inhibitory concentration (MIC) of 67 and 61 *E. coli* isolated from chicken and pig feces respectively by agar dilution. Differences of *E. coli* resistant to streptomycin and other three antibiotics (cefotaxime, ciprofloxacin and tetracycline) were analyzed using Probit model with Statistical Product and Service Solutions (SPSS). High-throughput quantitative PCR (HT-qPCR) was then used to evaluate the relative abundance of antibiotic resistance genes (ARGs) in *E. coli*. Figure 1 showed that all isolates were resistant to streptomycin and tetracycline. For the other two antibiotics, the resistance difference between chicken and pig feces isolates was significant ($P < 0.05$). In the range of 10-90% inhibition rate, the order of resistance among *E. coli* isolated from chicken feces was streptomycin > tetracycline > cefotaxime > ciprofloxacin. However, the order of resistance among *E. coli* isolated from pig feces was streptomycin > tetracycline > ciprofloxacin > cefotaxime. $MIC_{50}$ of streptomycin was 2.36-217.78-fold higher than other three antibiotics. Additionally, $MIC_{50}$ of streptomycin in chicken feces isolates was 1.89 times higher than that in pig feces isolates. HT-qPCR indicated that aminoglycoside resistance gene was dominant, especially *aphA1* in chicken feces isolates and *aadA1* in pig feces isolates (Figure 2). Relative abundance of transposons in pig feces isolates was even two times higher than that in chicken feces isolates, which resulted in high resistance rates of *E. coli* in pig feces (Figure 3). Our results demonstrated that *E. coli* isolated from chicken and pig feces was highly resistant to streptomycin, suggesting that further investigation should be conducted. Our findings provided important information for risk assessment and control of the resistance of *E. coli* in livestock farms.




A B

**Figure 1.** Curvilinear regression of *E. coli* isolated from (A) chicken feces and (B) pig feces.

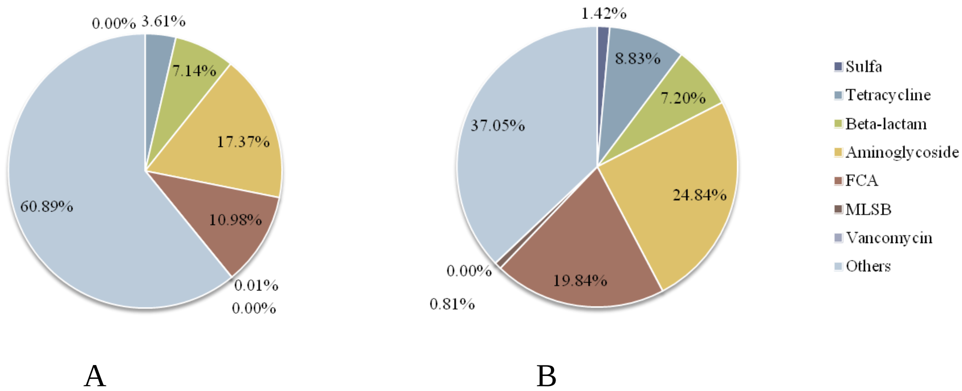



**Figure 2.** Percentage of ARGs in *E.coli* isolates, including 8 genotypes (e.g., sulfa, tetracycline, beta-lactam, aminoglycoside, FCA (florfenicol, chloramphenicol, and amphenicol); MLSB (Macrolide-Lincosamide-Streptogramin), vancomycin and others) isolated from (A) chicken feces and (B) pig feces.

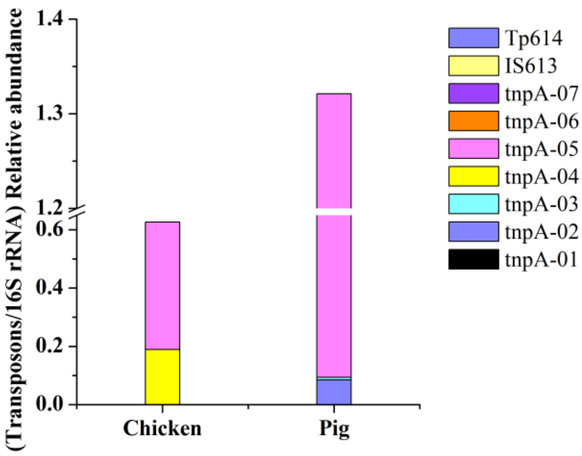



**Figure 3.** Relative abundance of transposons in *E. coli* isolated from chicken and pig feces.