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**Tracing ESBL-/pAmpC- producing *Escherichia coli* in conventional broiler farms during cleaning and disinfection procedures using whole genome sequencing**

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**Abstract:**

**Background/Objective:** Extended-Spectrum Beta-Lactamase- (ESBL-) and plasmid mediated AmpC Beta-Lactamase- (pAmpC-) producing Enterobacterales are frequently detected in broiler farms. Potential transmission routes and intervention measures in the food chain, in the environment and to humans were investigated against ESBL- and pAmpC- producing bacteria, but few data are available on the effects of cleaning and disinfection (C&D) procedures in broiler stables on ESBL- and pAmpC- producing bacteria.

**Methods** We systematically sampled five broiler stables before and after C&D using boot swabs, pooled feces samples and gauze swabs. Samples were processed on MacConkey agar with cefotaxime and phenotypically resistant *E. coli* isolateswere further analyzed for their beta-lactam resistance genes and phylogenetic groups, as well as the relation of isolates from the investigated stables before and after C&D by whole genome sequencing.

**Results:** ESBL- and pAmpC- producing *E. coli* was detected at sites where C&D was not performed or where insufficient cleaning was performed prior to disinfection. Highly related ESBL-/pAmpC- producing *E. coli* isolates were detected before and after C&D in four of five broiler stables using cgMLST. Survival as well as transmission of resistant isolates in investigated broiler stables or from broiler stables to the anteroom and surrounding environment and between broiler farms was shown.

**Conclusion:** C&D can reduce ESBL-/pAmpC- producing *E. coli* in conventional broiler stables. Complete ESBL- and pAmpC- elimination does not seem to be possible in practice as several factors influence the C&D outcome. Multifactorial approaches, combining various hygiene- and management measures are essential to reduce ESBL-/pAmpC- *E. coli* in broiler farms.

**Keywords:** ESBL, *Escherichia coli*, broiler chicken, cleaning and disinfection, whole genome sequencing, transmission