



Sharp decrease of CMY-2 producing *E. coli* in a broiler parent stock flock

Anita Dame-Korevaar¹ | Egil Fischer¹ | Alieda van Essen-Zandbergen² | Kees Veldman² | Arjan Stegeman¹ | Dik Mevius^{2,3} | Jeanet van der Goot²

1 Department of Farm Animal Health, Faculty of Veterinary Medicine, Utrecht University, Utrecht, the Netherlands

2 Central Veterinary Institute of Wageningen UR, Lelystad, the Netherlands

3 Department of Infectious Diseases and Immunology, Faculty of Veterinary Medicine, Utrecht University, Utrecht, the Netherlands

Aim

ESBL/AmpC producing bacteria are found throughout the broiler production pyramid¹. The aim of this study is to determine the prevalence, concentration and persistence of ESBL/AmpC-*E. coli* in a broiler parent stock flock during the rearing and laying period.

Material and Methods

3184 one-day old birds (broiler parent stock) were housed in 4 separated groups. During the rearing period 57 birds per group ($n=228$), and during the laying period 2 groups of 33 animals were sampled using individual cloacal swabs. Environmental samples were taken from week 16 onwards, using bootsocks. ESBL/AmpC-*E. coli* presence was determined by selective culturing of the samples. All suspected isolates were positive for CMY-2 located on IncA/C plasmids. For a selection of the isolates genotyping (MLST) was done and the concentration of CMY-2-*E. coli* was determined. During the study the birds didn't receive antibiotics or coccidiostats.

Results

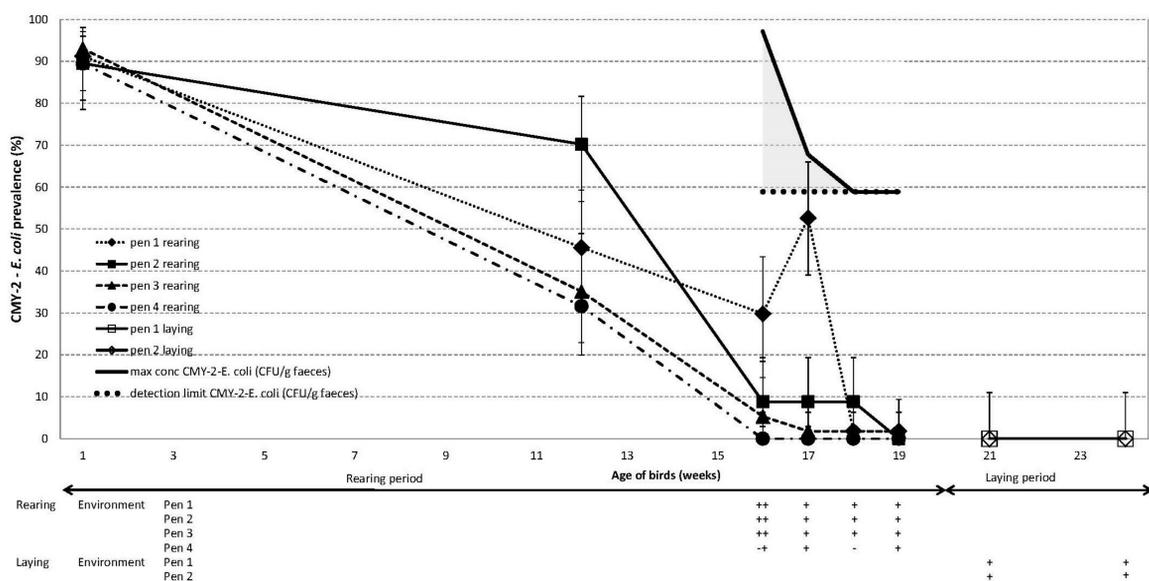


Figure 1. CMY-2-*E. coli* prevalence (%), concentration (CFU/g faeces) and presence in the environment in a broiler parent stock flock during rearing and laying period.

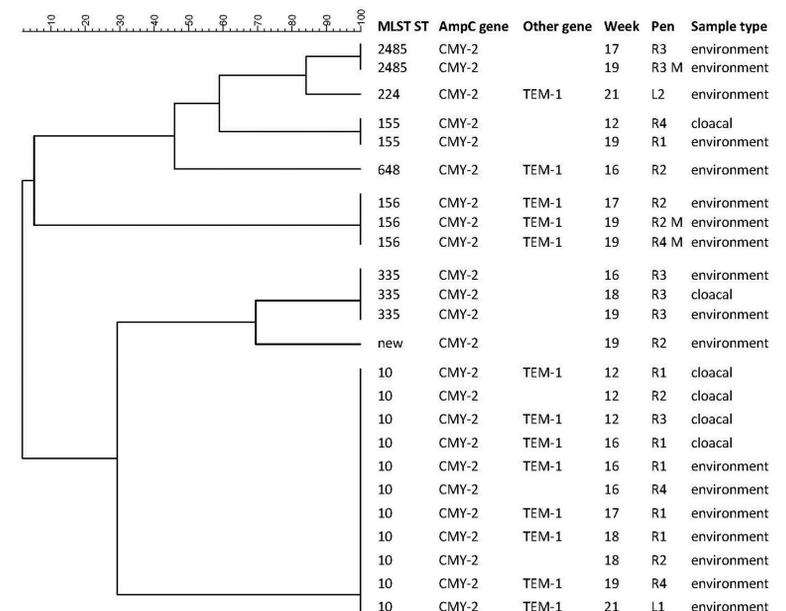


Figure 2. Multilocus sequence typing (MLST) of cloacal and environmental samples from hens and males (M) in different pens during rearing (R1 - R4) and laying (L1, L2) period.

Conclusion

Results show a sharp decrease of CMY-2-*E. coli* prevalence in broiler parent stock during the rearing and laying period. Low concentrations of CMY-2-*E. coli* in the cloacal swabs and positive environmental samples suggest that birds were excreting small amounts of CMY-2-*E. coli*, or that intermittent shedders were present. Another explanation would be that birds ceased shedding CMY-2-*E. coli*, but environmental contamination persisted. Although clonal and plasmid spread has occurred, in the absence of antibiotics the prevalence of CMY-2-*E. coli* in broiler parent stock reduced sharply, suggesting a selective disadvantage of *bla*_{CMY-2} on IncA/C plasmids.

References

¹Dierikx et al. Presence of ESBL/AmpC -producing Escherichia coli in the broiler production pyramid: A descriptive study. *PLoS ONE* **8** (2013).

Acknowledgement

This study was funded by the public-private collaborative project: 1H4F-Reduction of ESBLs: evaluation of ESBL intervention (AF 14210)

Contact

Anita Dame-Korevaar
m.a.dame-korevaar@uu.nl

