Detection of *Arcobacter* spp. in gastrointestinal tracts of broiler chicken

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Introduction

Arcobacter spp. is an often detected microorganism in poultry abattoirs. The intestinal content of broiler chicken is one assumed source of entry, although studies that examined intestinal content of broiler chicken did not reliably detect *Arcobacter* spp. Moreover, these studies are not completely comparable as the content of various sections of the intestinal tract has been examined. The aim of this study is to examine the whole intestinal tract of broiler chicken consecutively at four different locations during the slaughtering process to evaluate in which section of the intestinal tract *Arcobacter* spp. could be reliably detected.

Material and Methods

Sample collection at the slaughterhouse
Altogether, 133 intestinal tracts from 15 flocks on 10 non-consecutive days have been examined. They were obtained from whole chicken carcasses after bleeding (n=32), scalding (n=16), and defeathering (n=21) as well as from separated viscera after evisceration (n=64).

Isolation and detection of *Arcobacter* spp.
The intestinal tracts were separated and 1g of each section (duodenum, jejunum, caecum, colon) was processed according to Houf et al. (2001) for qualitative detection of *Arcobacter* spp. The species of suspected colonies were confirmed by mPCR according to Houf et al. (2000) and *rpoB* sequencing according to Korczak et al. (2000). *Arcobacter* loads were also semiquantitatively investigated by the MPN-method based on ISO/TS10272-3:2010/Cor.1:2011(E).

Results

After bleeding, *Arcobacter* spp. were detected in 6 % of the colonic samples (Fig. A), with a load of 2.3 and 230 MPN/g, respectively (Fig. B). Even though no *Arcobacter* spp. were detected after scalding, *Arcobacter* spp. were detected in 29 % of duodenal, 24 % of jejunal, 5 % of caecal and 62 % of colonic samples after defeathering (Fig. C). The highest *Arcobacter* load was determined in colonic content (> 24,000 MPN/g) while in duodenal and jejunal contents up to 2,400 MPN/g were detected (Fig. D). After evisceration, *Arcobacter* spp. were detected in 30 % of duodenal, 44 % of jejunal, 8 % of caecal and 84 % of colonic samples (Fig. E). The highest *Arcobacter* load was also determined in the colonic section (> 24,000 MPN/g) (Fig. F). In 90 % of the samples only *A. butzleri,* in 2 % of the samples only *A. cryaerophilus* and in 8 % of the samples both species have been detected together.

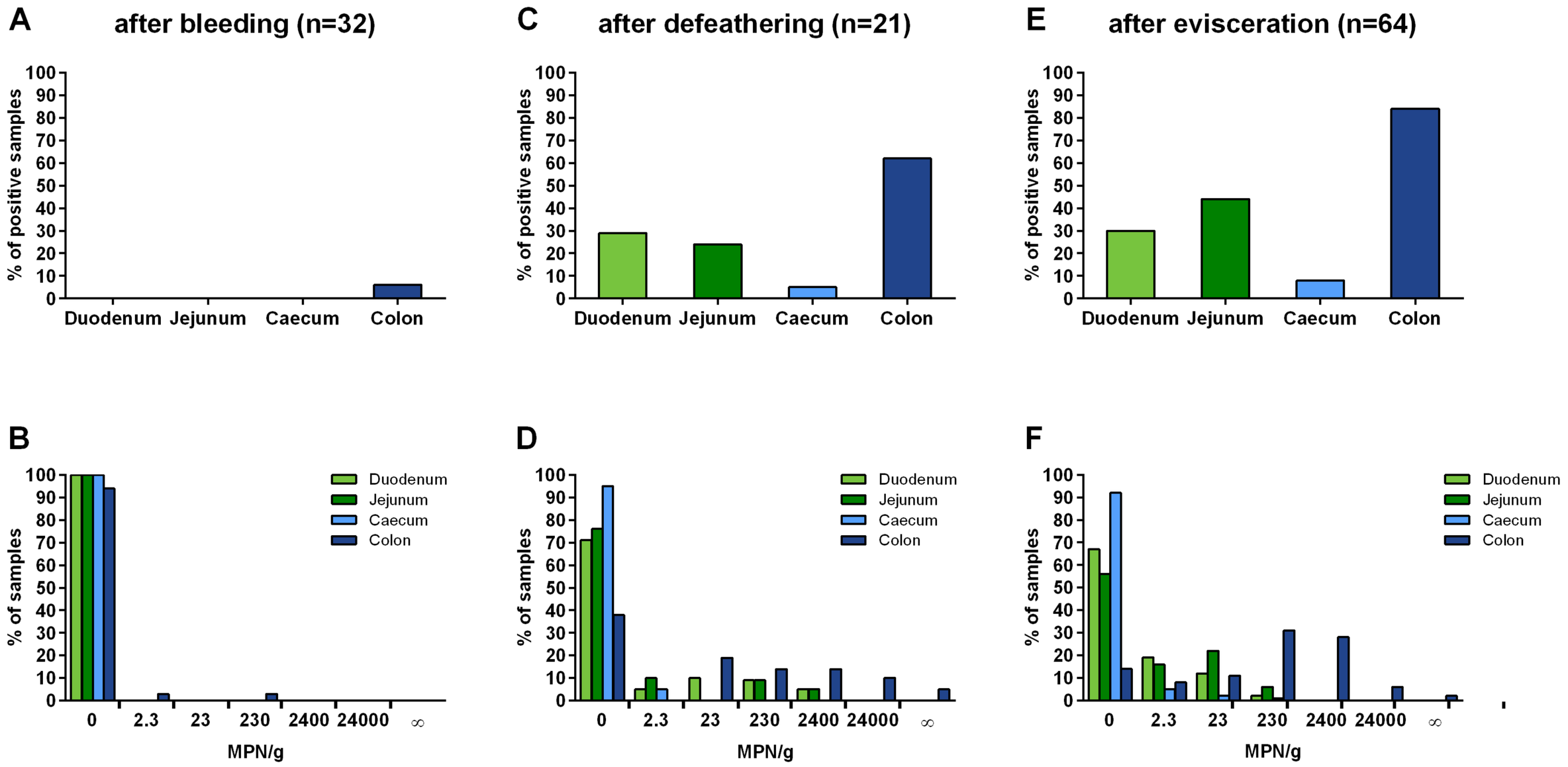

Fig. 1: : Prevalence (A, C, E) and loads (B, D, F) of *Arcobacter* spp. in different intestinal sections of chickens during the slaughtering process.

Conclusion

Arcobacter spp. was detected predominantly and with the highest loads in the colon. In contrast to *Campylobacter, Arcobacter* was only sporadically detected in the caeca. The low detection rate of *Arcobacter* after bleeding and scalding indicates that the intestinal tract of chicken is not likely to be the only source of entry into the poultry abattoir, as already discussed by Houf et al. (2002). Nevertheless, after defeathering a significant increase ($p < 0.0001$) of *Arcobacter* prevalence in the intestinal content was detected for the first time during the slaughtering process. The high prevalence and loads of *Arcobacter* in the intestinal sections after defeathering and after evisceration could not be solely explained by contamination through slaughter equipment, as already discussed by Houf et al. (2002). Therefore, further investigation is needed to identify the additional source of *Arcobacter* entry into the poultry abattoir.

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