Impact of a drug-free program on broiler chicken growth performances, gut health, *Clostridium perfringens* and *Campylobacter jejuni* occurrences at farm level

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Abstract

Introduction: The use of antimicrobial agents as feed additives in poultry production is a public health concern due to the overall increase in antimicrobial resistance. Although some alternative products are commercially available, little is known on their potential impact on flock health and productivity. **Objective:** A prospective study involving 1.55 million birds was conducted on eight commercial broiler farms in Québec, Canada, to evaluate the impact of replacing antibiotic growth promoters and anticoccidial drugs by a drug-free program including improved brooding conditions, anticoccidial vaccination, essential oil-based feed additives and water acidification.

Methods: Various productivity and health parameters were compared between barns allocated to the conventional and the drug-free program. Zootechnical performances were monitored as productivity criteria. Clinical necrotic enteritis and subclinical enteritis occurrences, litter and fecal moistures content were measured, microscopic gut health was evaluated. *Clostridium perfringens* and *Campylobacter spp.* strains were recovered from fecal samples collected during farm visits. *Clostridium perfringens* counts were used as poultry health indicators and *Campylobacter* prevalence was noted as well.

Results: The drug-free program was associated with significant increase in feed conversion ratio and decrease in mean live weight at slaughter and in daily weight gain. An increased incidence of necrotic enteritis outbreaks and subclinical enteritis cases, as well as an increase in litter moisture content at the end of the rearing period were also observed for this program. Mean microscopic intestinal lesion scores and prevalence of *Campylobacter* colonization were not statistically different between the two groups but the drug-free program was associated with higher *Clostridium perfringens* isolation rates. **Conclusion**: According to the current study design, results suggest that substitution of antibiotic growth promoters and anticoccidial drugs by a drug-free program impacts various broiler chicken production parameters and *Clostridium perfringens* carriage levels.