

## Abstract

Scientific advances in pathogen decontamination offer great potential to reduce Campylobacter spp. during primary processing. The aim of this study was to collate data from eligible studies using systematic review, meta-analysis followed by meta-regression. Random effect meta-analysis revealed heterogenous ( $\tau^2 = 0.6$ ,  $I^2 = 98\%$ ) pooled reduction in *Campylobacter* concentration of 0.6 log<sub>10</sub> CFU/carcass and a decrease in relative risk of *Campylobacter* spp. prevalence in broiler carcasses by 57.2%. Decontamination interventions during Inside-Outside-Carcass-Wash were most effective on concentration (0.8 log<sub>10</sub> CFU/carcass) while those during evisceration were most effective on prevalence (78.0% decrease in relative risk). Physical decontamination was more effective on *Campylobacter* prevalence (68.7% decrease in relative risk) compared chemical treatment (30.3%). Application through immersion was superior on *Campylobacter* concentration (0.9 log<sub>10</sub> CFU/carcass odds reduction) to spraying (0.5 log<sub>10</sub> CFU/carcass odds reduction). Publication bias and small study effect were observed in trials on *Campylobacter* prevalence but not for concentration. The meta-regression revealed four and seven potential modifier variables for concentration and prevalence respectively. This meta-analysis provides an overview of the expected magnitude in *Campylobacter* spp. concentration and prevalence with application of decontamination interventions on broiler carcasses along the slaughter process and forms a basis of quantitative microbial risk assessment and derivation of intervention measures. Even though modest microbial concentration reduction is reported there was a large decrease in contamination prevalence during processing interventions.