Water wash cleanses barns between broiler chicken flocks, without need for disinfection

April 27 2022

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In Canadian broiler chicken production, removal of litter, washing, and disinfection have typically taken place to prepare barns for new flocks. More recently, new regulations have allowed for water washing between flocks, without disinfection. University of Alberta researchers have found that water wash by itself reduced the numbers of the pathogen,

Campylobacter jejuni, in birds and in the barn environment, with no negative effect on birds' growth and health, as compared to those grown in barns that had been fully disinfected. The research is published in *Applied and Environmental Microbiology*.

The findings are "immediately applicable to the poultry industry," said Doug Korver, Ph.D., professor of Poultry Nutrition, University of Alberta, Edmonton, Canada.

"Broiler chicken producers had been looking for ways to reduce costs while maintaining or increasing food safety and bird growth," said Korver. The complete removal of litter, followed by disinfection "had been intended to remove environmental microbial pathogens, but an unintended consequence is that potentially beneficial bacteria are also removed." That, he said, may have reduced the rate at which a normal, stable, healthy gut microflora is achieved in the subsequent flock, possibly slowing the birds' growth and/or reducing their health.

In the study, the investigators worked with a commercial broiler producer that had seven broiler barns, each housing approximately 28,000 broiler chickens. During 4 production cycles, the barns were either water washed, or fully disinfected. When the chickens reached 30 days old, the investigators sampled the ceca (the first section of the large intestine) to assess the presence and abundance of specific pathogens, notably Salmonella and C. jejuni.

"Cecal concentrations of short-chain fatty acids were increased in the water wash group," said coauthor Ben Willing, Ph.D., associate professor and Canada Research Chair in the Microbiology of Nutrigenomics, University of Alberta..

"An increase in short-chain fatty acids was associated with a decrease in campylobacter in our study," said Willing. "In general, microbially

produced short chain fatty acids in the gut increase acidity, creating an inhospitable environment for many pathogens, and also serving as fuel for intestinal cells. The short chain fatty acids also modulate immune responses."

Overall, by itself, water washing between flocks reduced the presence of C. jejuni, with no deficits in growth and microbiome health. That, in addition to reduced disinfectant and labor costs, make water washing between flocks an attractive option for broiler chicken producers.

More information: Yi Fan et al, The Use of Disinfectant in Barn Cleaning Alters Microbial Composition and Increases Carriage of Campylobacter jejuni in Broiler Chickens, *Applied and Environmental Microbiology* (2022). DOI: 10.1128/aem.00295-22

Provided by American Society for Microbiology