

CLEANER CRATES CUT CAMPYLOBACTER DURING TRANSPORTATION



***Campylobacter* is the most commonly reported cause of food poisoning in England and Wales, with undercooked meat, particularly poultry being a major source of human illness.**

Campylobacter from the gut of poultry is known to contaminate environments where poultry are found. Chicken transportation crates are often contaminated by *Campylobacter* and act as a vector of transmission, passing the bacteria between unrelated flocks. This transmission is believed to contribute to the continued source of infection and contamination in the poultry industry.

Aim

BioCote® has partnered with a supplier of innovative and leading-edge products for the food processing industry to incorporate a silver ion antimicrobial technology into the manufacture of their poultry crates.

BioCote® antimicrobial technology inhibits the growth of a wide range of bacteria on the surface of products, making them cleaner and more hygienic to use.

Using antimicrobial technology, BioCote's partner aims to reduce the number of *Campylobacter* on the treated crates, potentially reducing the number being transported around the poultry rearing and processing system and limiting the potential of the ongoing transmission.

This study was carried out to investigate the effect BioCote® had on the number of *Campylobacter* contaminating chicken transportation crates.

It compared the total number of bacteria, including *Campylobacter*, contaminating the BioCote® treated crates to standard, untreated crates at key stages of the decontamination process: pre-wash e.g. immediately before entering the decontamination process, postwash, post-sanitisation and one, two and three hours post sanitisation.

Study

BioCote® treated and untreated crates were used to transport chickens from farms to the processing plant for four weeks prior to the trial.

Swabs were collected from ten standard and ten BioCote® treated crates in triplicate at key points throughout the decontamination process.

Swabs were processed in the laboratory to identify the presence of *Campylobacter* and total viable counts of bacteria (TVC) and results were expressed as average colony forming units (CFUs).

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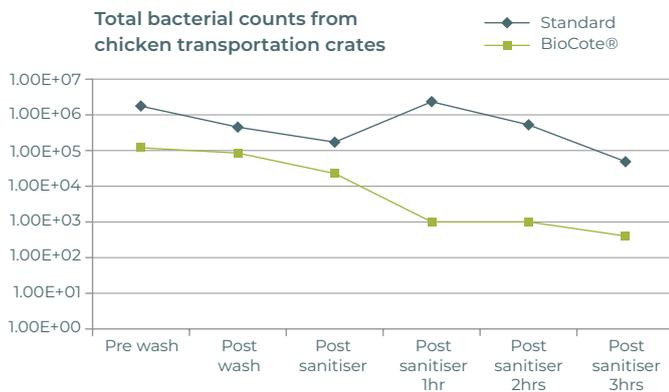
Results

At each stage of the decontamination process standard crates were shown to harbour consistently higher levels of bacteria than BioCote® treated crates. These differences ranged from five times higher after washing, to 2600 times higher, one hour after sanitisation (see **Figure 1**).

Whilst average counts of bacteria fell constantly throughout the decontamination process on the BioCote® treated crates, counts on the standard crates increased one hour after sanitisation (see **Figure 1**).

Figure 1

Mean counts of bacteria isolated from chicken transportation crates during the decontamination process, presented on a logarithmic scale



Conclusions

Sustainably lower contamination

BioCote® treated crates were shown to be considerably less contaminated with bacteria than standard crates at all points of the decontamination process.

This indicates that the antimicrobial effect of BioCote® was sustainable throughout the cycle of the crates, from contact with flocks, through the decontamination process, to re-contact with flocks.

Campylobacter eliminated

There were fewer *Campylobacter* isolated from treated crates compared to untreated crates at all points of the decontamination process. At the three hour post-sanitisation stage, when crates can make contact with new flocks, only one *Campylobacter* isolate was collected from BioCote® treated crates compared to 44 from standard crates.

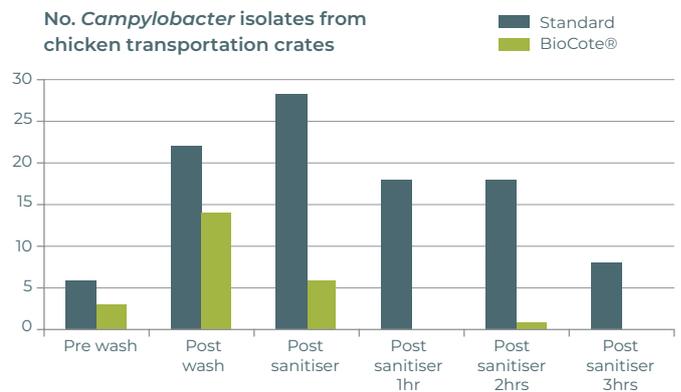
These results suggest that BioCote® protection can help reduce the risk of crates being the cause of *Campylobacter* cross-contamination amongst flocks.

The number of *Campylobacter* isolated from the crates is shown in **Figure 2**. Standard crates consistently yielded more *Campylobacter* isolates than BioCote® treated crates at all points of the decontamination process.

During the three hours after sanitisation, 44 *Campylobacter* isolates were obtained from the 90 swabs taken from standard crates. In comparison, only one isolate was obtained from the 90 swabs taken from BioCote® treated crates. *Campylobacter* was also isolated from the wash water.

Figure 2

Numbers of *Campylobacter* isolates from standard and BioCote® treated chicken transportation crates during the decontamination process.



Complements cleaning

The increase in total bacterial counts, including *Campylobacter*, on standard crates one hour after sanitisation indicates that this cleaning process had no long-term decontamination effect. In contrast, counts of total bacteria continued to decrease on BioCote® treated crates for the duration of the sampling. As cleaning and sanitisation proved ineffective in eradicating *Campylobacter* from the surface of crates, BioCote® could act as an additional decontamination solution.

Industry benefits

This study suggests that incorporating BioCote® into poultry transportation crates or other such products or surfaces may ultimately help reduce the risk of harmful bacteria, such as *Campylobacter*, being transmitted from poultry to humans.

The results of this trial suggest there is potential for BioCote® to be used in other areas of the food industry, to assist in reducing harmful bacteria and the risks of cross-contamination.

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