Control campylobacter: Best practice guide for crate washing systems

Campylobacter is the leading cause of foodborne illness in Europe (EFSA 2017). Studies indicate that poultry and poultry products are significant sources of human infection.

There have been a number of studies of campylobacter control in flocks in recent years with the environment and drinking water being suggested as possible sources of campylobacter establishment in a flock.

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Improved farm hygiene measures, such as boot dipping and boot changing, which presumably prevent the introduction of campylobacter spp. from the external environment into a broiler chicken house, may either delay or prevent settlement of the bacterium.

Transport vehicles and crates may have been an additional source of contamination between batches of birds and farms. Such contamination may be particularly important for the introduction of campylobacter into previously uninfected flocks during transport or during flock thinning.

Newell and Wagenaar (2000) found that on one occasion carcases from a campylobacter-negative flock were contaminated with a campylobacter subtype that was isolated from crates prior to loading of the birds. This was a limited study in which the researchers examined only the crates prior to loading of the birds during the transport of one flock.

The use of reusable crates is commonplace throughout the food industry. However, the cleaning and disinfection operation is often not well maintained, and systems may not give adequate performance for a variety of reasons.

The operation can be difficult, needing to be done rapidly, and monitoring and quality control can be poor. The result is a high risk of microbial contamination of the trays; this is especially so in the poultry industry with the re-use of crates to bring successive batches of live birds (from a variety of farms) to a processing factory.

In relation to the application of HACCP principles to poultry processing, the recycling of dirty transport crates between the processing plant and rearing farms poses a substantial risk of flock-to-flock transmission of pathogens.

There is evidence that contamination of the skin and feathers of broilers with salmonella or campylobacter increases during transportation. In addition, many flocks that are not apparently carriers of campylobacter on the farm are externally contaminated with these organisms after transportation to the processing plant. Mead et al, 1995, also noted that routine cleaning of crates in the UK was inadequate. The problem is again exacerbated by the need to clean crates rapidly.

So what is 'Best Practice?'

Best practice in cleaning crates and modules should initially seek to achieve visual cleanliness. Points to consider include:

- The location and surrounding operations to the crate and module washer to reduce cross-contamination between clean and dirty crates/modules.
- Pre-wash soak.
- Elevated temperature of wash soak.
- Frequent refreshing of wash soak water – use a counter current flow from final rinse, soak tank and then pre-soak tank.
- Consistent dosing of detergent.
- Monitoring of operating conditions (temperature, detergent concentration, water cleanliness) to maintain optimum efficacy.

If visual cleanliness can be achieved, disinfection becomes a reality and will significantly contribute to further microbial control. Best practice should achieve:

- Good drainage of crates and modules to reduce detergent/rinse water pooling.
- Consistent total coverage of the crate/module with an oxidative disinfectant.
- Consistent dosing of disinfectant.
- Monitoring of operating conditions (temperature, disinfectant concentration, disinfectant contact time) to maintain optimum efficacy.

Note: If elevated temperature is to be used to achieve disinfection, the process must be validated to ensure all internal and external surfaces of the crates and modules achieve a pasteurisation time and temperature.

Previous findings from the FSA (2015) identified the most effective treatments to reduce campylobacter as a combination of soaking at 55°C, brushing for 90s, washing for 15s at 60°C followed by application of disinfectant. Adding brush systems to existing systems would be impractical.

In practice, manufacturers of crate cleaning systems invariably use water sprays. Although some increased water agitation and extra spraying components could be added to some systems it is known that for these to be reasonably effective they need to be considerable and to include medium pressure (typically 20 bar). This implies that they must be fitted with good filtration systems to ensure that nozzles do not become blocked rapidly.

Instead of retro-fitting additional pumps, nozzles and filtration it should be considered that a commercially available crate washing unit, designed specifically for this application, would ensure that suitable flow-rates, nozzles and a good filtration system would be provided in a convenient, robust and reliable package. ■

References are available from the author on request