Evaluation of changes induced by temperature and storage after dilution in the efficacies of disinfectants against the avian influenza virus

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Avian influenza viruses are highly susceptible to all disinfectants because they are enveloped viruses. Disinfectants effective against AIVs have optimum efficacies at temperatures above 20°C. Very few studies on effective disinfectants at low temperatures have been done.

The aim of this study was to evaluate the change in the efficacy of 6 disinfectants approved for use against the avian influenza virus (AIV). Disinfectants were investigated at four different temperatures (25°C, 4°C, 0°C, and −10°C) and two contact times (1 min and 5 min) with suspension tests. Further storage time (3, 10, 20, and 30 days) on the efficacy of disinfectants diluted to two working concentration (hard water and organic material condition) also investigated. The results from the suspension test indicated that low temperatures inhibited the virucidal efficacy of citric acid (CA) and citric acid + quaternary ammonium compounds (CA+ QACs) for both 1 min and 5 min, while the remaining disinfectants were effective, regardless of the short contact times and low temperatures. The working concentration with organic material condition may be stored for up to 30 days at room temperatures without loss of effectiveness against AIVs however, in the hard water condition, the efficacy of diluted disinfectants were reduced after 3 days old.

For a successful disinfection during winter, the disinfectants which could have short contact times with optimum efficacy and freshly prepared disinfectant performed better in the hard water condition.
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**Characterization of Betaine Aldehyde Dehydrogenase (BetB) as an Essential Virulence Factor of *Brucella abortus* **

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*Brucella abortus* is an intracellular pathogen that can invade and replicate within host cells, which causes chronic zoonotic disease. The pathogenic mechanisms that this pathogen exploits to adapt to the harsh intracellular environment of the host cell are not fully understood. The present study investigated the *in vitro* and *in vivo* characteristics of *B. abortus* betaine aldehyde dehydrogenase (betB) using the betB deletion mutant constructed from virulent *B. abortus* 544. The betB mutant showed higher internalization than wild-type strain, whereas fails to replicate in HeLa cells and RAW 264.7 macrophages unlike wild-type. Importantly, during internalization the betB mutant promoted adherence to host surface and enhanced phosphorylation of protein kinases involved in phagocytic activities compared to the wild-type in host cells. Otherwise, colocalization of *B. abortus*-containing phagosomes with LAMP-1 was elevated in betB mutant-infected cells compared to wild-type during intracellular trafficking. In mice, the betB mutant was greatly cleared from spleens compared to the wild-type strain after 2 weeks post-infection and the vaccination test with live betB mutant showed effective protection against