

Efficacy of Accelerated Hydrogen Peroxide[®] Disinfectant on Foot-and-Mouth Disease Virus, Swine Vesicular Disease Virus and Senecavirus A

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ABSTRACT

Since late 2014, vesicular disease linked to Senecavirus A (SVA) has been observed in pigs in Canada and the US, among other countries. The disease is linked to idiopathic vesicular diseases in swine, with lesions similar to those caused by foot-and-mouth disease virus (FMDV).

Swine vesicular disease virus (SVDV), FMDV and SVA are small, non-enveloped RNA viruses of the Picornaviridae family. FMDV is one of the most contagious animal pathogens infecting cloven-hoofed mammals. In FMD-free countries, an accidental release into the environment can cause an outbreak of disease leading to severe economic loss.

SVDV is stable at a pH as low as 2.5 and as high as 12, is more resistant to both heat and disinfectants than FMDV and thus survives for longer periods in the environment. A disinfectant capable of inactivating SVDV will most likely also inactivate FMDV, therefore SVDV can be used as a surrogate for FMDV during research investigations.

STUDY

The purpose of this study was to evaluate Prevail[™] Concentrate against high consequence foreign animal disease pathogens such as foot-and-mouth disease virus (FMDV) and swine vesicular disease virus (SVDV), as well as Senecavirus A (SVA), which causes similar lesions as FMDV and SVDV. In FMD-free countries, only high containment laboratories are allowed to work with FMDV and related viruses. Therefore, proper disinfection is crucial in these laboratories and is routinely used to decontaminate work surfaces, animal cubicles, biosafety cabinets and equipment.

All viruses used for testing were kindly provided by Animal Research Services, Plum Island Animal Disease Center. Varying dilutions and contact times of Prevail were tested against FMDV, SVDV and SVA by standard US EPA and modified methods.

Virus diluted in media was spread as uniform thin films on duplicate sterile glass petri dishes. Films were either dried at ambient temperature for approximately 1 h (SVDV only) or treated as wet films (SVDV, FMDV and SVA), followed by the addition of diluted Prevail with a designated contact time. Cytotoxicity of disinfectant, neutralizer effectiveness and the virucidal effect of Prevail against SVDV by the Standard Test Method, virucidal effect of Prevail against the three viruses using Wet Films of Virus, and long term stability tested were all evaluated.

RESULTS

Prevail[™] Concentrate used at the manufacturer recommended dilution of 1:40 is an effective disinfectant against SVDV when tested by the standard method. However, at 1:40 dilution, for laboratory practical purposes, it could be ineffective at completely disinfecting wet surfaces contaminated with SVDV. Nevertheless, at 1:20 dilution and 10 minute contact time, Prevail has complete virucidal effect on wet films of SVDV, FMDV and SVA. Therefore, for laboratory, it is recommended to use Prevail at a 1:20 dilution with a contact time of at least 10 minutes. Furthermore, Prevail at 1:20 dilution stored in a sealed container is stable at room temperature for at least six weeks.

STUDY CONCLUSION

Prevail™ Concentrate is an effective disinfectant against FMDV, SVDV and SVA, and can therefore be used in high containment laboratories working with FMDV, SVDV and related pathogens.

REFERENCE

Hole K, Ahmadpour F, Krishnan J, Stansfield C, Copps J, Nfon C. (2017). Efficacy of accelerated hydrogen peroxide disinfectant on foot-and-mouth disease virus, swine vesicular disease virus and Senecavirus A. *Journal of Applied Microbiology*. 122(3): 634-639.

IMPLICATIONS FOR PREVAIL

Prevail provide the perfect balance between safety and efficacy

- Despite exceptional efficacy against relevant swine pathogens, Prevail has no harsh chemical smell and is non-irritating to eyes and skin once diluted.

Prevail has realistic contact times

- Kills pathogens in just 5 minutes once diluted at 1:40, twice as fast as other common disinfectants.

Prevail is compatible

- Prevail is tough on pathogens but gentle on surfaces: it is safe to use on a wide range of commonly-used materials and equipment in farms and barns, preventing wear and tear on your valuable investments.

Prevail is environmentally sustainable

- Prevail's active ingredient is biodegradable and breaks down into water and oxygen, preventing adverse effects on pit or lagoon biology and minimizing environmental impact.

Prevail Disinfectants are One-Step Disinfectant Cleaners

- Formulated with powerful detergents, Prevail has exceptional cleaning capabilities. Its excellent foaming ability allows you to easily visualize surface coverage, ensuring that a little bit of your diluted disinfectant goes a long way.



Prevail™ is a member of the Virox family of brands.