METHOD FOR DECONTAMINATION OF THE MUMPS VIRUS USING THE SANI SPORT VE

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ABSTRACT

The objective of this study was to ascertain the degree to which the Sani Sport VE technology can neutralize and / or eliminate high concentrations of the Mumps virus.

RESULTS

A significant anti-viral efficacy has been noticed after a period of 20 minutes of exposure to ozone gas concentration of 20-25 ppm in all samples of indoor air and internal surfaces of experimentally contaminated room, which showed that the virus was inactivated, ranging from at least $5Log_{10}$ to undetectable.

These results confirm that the Sani Sport VE offers scientifically proven technology that can achieve rapid and efficient viral decontamination of both highly contaminated indoor air and internal surfaces.

References:

- Mumps virus (ATCC106)
- SL-29 Cells (AATCC SLR 1590)
- ASTM E1053-97: Standard, Test Method for efficacy of virucidal agents intended for inanimate environmental surfaces
- EN 14476: Chemical disinfectants and antiseptics-Quantitative test in virucidal suspension for chemical disinfectants and antiseptics used in human medicine test method and requirements (Step 1) April 2005

MUMPS VIRUS

Commercially available Mumps virus (ATCC VR-106) was cultured accordingly to ATCC protocol which was then used for the production of experimental virus suspension, as well as the evaluation of deactivation of the virus by ozonification.

The virus experimental suspension was prepared as clarified cell-free supernatant, with concentration of 1.3×10^9 PFU (plaque forming units) per ml. Then, the experimental suspension was spread throughout the ambient air and internal surfaces of the experimental contaminated room.

DETERMINATION OF THE TITRE OF THE VIRUS

To determine the titre of the virus in experimental viral suspension, control and experimental surface samples, serial dilutions of viral suspensions were applied to a confluent cell layer of SL-29 cells (ATCC CLR1590). After a 1 – h infection, the virus was removed and the cells were kept in culture for an additional 16 hours. The PFU were determined by an immunostaining approach.

CONCLUSIONS

Viability of the virus in experimental samples, taken from indoor air and internal surfaces of experimentally contaminated room after ozonification is shown in Fig 1.

Fig 1. Viability of the virus in samples taken from indoor air and internal surfaces of experimental room after ozonification

Samples	PFU/p^2*	Log_{10} of reduction**
Ambient Air	Non-detect	8.07
Floor		
- Sample 1	1.1 X 10^3	5.48
- Sample 2	8.3 X 10^2	5.45
- Sample 3	1.2 X 10^3	4.59
Ceiling		
- Sample 1	1.6 X 10^2	5.78
- Sample 2	2.3 X 10^2	5.69
- Sample 3	1.5 X 10^2	5.72
Wall		
- Sample 1	3.2 X 10^2	5.67
- Sample 2	2.1 X 10^2	5.61
- Sample 3	2.9 X 10^2	5.72
- Sample 4	2.8 X 10^2	5.64

*PFU = plaque formation units
** When compared to control samples

The virus showed decrease in infectivity going from undetectable in the ambient air up to 5.45Log_{10} as a result of the ozonification process.

This study shows that the Sani Sport VE is able to significantly reduce (kill) the Mumps virus in indoor air and on internal surfaces in the experimentally contaminated room.

The viral reduction has been shown to be at least three 5Log_{10} going up to a total reduction, under experimental conditions used.

A process that achieves a 5Log_{10} reduction will reduce a population from one million organisms to very close to 0 (non-detectable).

A 6Log kill is known as sterilization, 99.9999% reduction. The present testing has proven that all results make between a 5Log kill and complete undetectability.