



INFORMATION ON STUDIES AND LABORATORY TEST RESULTS

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SARS-CoV-2 Neutralization by UV Exposure

Conducted by

Innovative Bioanalysis—Costa Mesa, CA

Summary

Aerapy UV disinfection technology achieved up to a 99.97% reduction of the SARS-CoV-2 pathogen in the air, in one air pass, in independent laboratory testing. Aerapy UV also achieved a 99.98% reduction on surfaces in two seconds (99.99% in three seconds). Results were achieved with proper installation and utilizing Aerapy's proprietary sizing method. Because the company did a live air pass test, Aerapy's results are unique among other UV laboratory studies of SARS-CoV-2 inactivation that perform simulated passes.

The third-party testing, conducted at the laboratories of Innovative Bioanalysis in Costa Mesa, Calif., utilized Aerapy UV equipment designed for HVAC systems where air passes across the Aerapy device, which harnesses the power of UV-C to deactivate bacteria, mold, and viruses in the air. The testing firm conducted an actual single pass of air test showing what would happen in a quarter or half second of time. The independent testing against SARS-CoV-2 was conducted in a chamber constructed at the laboratory and designed to mimic an indoor environment with HVAC in place.

VIRAL STOCK: SARS-CoV-2 USA WA1/2020 (BEI NR-52281)

Inactivation of Pathogens Including MRSA

Conducted by

BCS Laboratories Inc.- Gainesville

Summary

Testing against pathogens including MRSA achieved a greater than 99.9% reduction.

Additional details

Inactivation of human and animal pathogens with Aerapy UV surface and air disinfection. Test was conducted as per AOAC Official Method 961.02; Germicidal Spray Products as Disinfectants (2005) and ASTM E1053-97 (Standard Test Method for Efficacy of Virucidal Agents Intended for Inanimate Surfaces).

Microorganism	Number of inoculated slides exposed to UVGI	Average infectious units (iu)/ml inoculated per slide [#]	Average iu/ml recovered from UVGI treated slides*	Percent reduction
Enterovirus (Poliovirus)	3	5.6×10^4	<1.0	>99.998%
Rotavirus SA11	3	1.6×10^4	<1.0	>99.994%
Feline Calicivirus F-9	3	2.3×10^4	<1.0	>99.996%
Canine Influenza H3N8	3	1.6×10^4	<1.0	>99.994%
Canine Parvovirus	3	9.2×10^3	<1.0	>99.98%
Methicillin Resistant <i>Staphylococcus aureus</i> (MRSA)	3	2.9×10^5	<5.0	>99.998%
<i>Bordetella bronchiseptica</i>	3	3.1×10^4	1.8×10^1	99.94%

This number represents the average number of recovered microorganisms from glass slides inoculated with pathogens, dried, and not exposed to disinfection treatment (positive control).

* Glass slides were inoculated with the indicated microorganisms and allowed to dry. Slides were exposed to the UVGI radiation at 22.0°C for 60 seconds. Slides were eluted as described in the methodology section. Aliquots of the eluant were inoculated onto respective media or cell culture lines for the detection and enumeration of pathogens. All analysis was conducted in duplicate.

Ultraviolet Air Disinfection of Zoonotic and Enzootic Pathogens

- **Bacteriophage MS2 reduced $\geq 99.62\%$**
- **B. bronchiseptica reduced $\geq 99.96\%$**
- **Canine distemper reduced $\geq 98.89\%$**
- **Feline herpesvirus not detectable**

Conducted by

Jennie Pearce-Walker, Daniel Troup, Marc Verhougstraete

The University of Arizona, Mel and Enid Zuckerman College of Public Health Environment, Exposure Science and Risk Assessment Center

June 1, 2018

SUMMARY

Objective

Quantitate the efficacy of the Aerapy UVGI system (the “UV system”) against airborne microorganisms [e.g., Bacteriophage MS2, Bordetella bronchiseptica, feline herpesvirus, and paramyxoviridae (canine distemper virus)] in a controlled heating, cooling, and air conditioning (HVAC) system.

Trial

During pre-treatment trials, microbial aerosolization via nebulization, sample collection via impingement, and the air duct fan were turned on simultaneously at the start of a trial. The system was run for 10 minutes in the controlled environment. Post-treatment trials followed the same protocol, with the addition of the UVGI system being active throughout the entire trial. Microorganisms were enumerated using published standard protocols.

Results

The UV system was most effective against airborne B. bronchiseptica, yielding an average reduction of ≥ 99.96 (30.02%). Aerapy UVGI bulbs reduced average MS2 airborne concentrations ≥ 99.62 (30.33%) and canine distemper associated virus ≥ 98.89 (30.62%). Feline herpesvirus was detectable in one sample during pre-treatment. After the UVGI system treatment, no feline herpesvirus was detectable

Study conclusion

UVGI systems, such as those produced by Aerapy, may represent a beneficial supplement to manual purification practices in the reduction of pathogen prevalence, which may indirectly reduce the risk of infections via the airborne route.

Effect of Ultraviolet Germicidal Irradiation of the Air on the Incidence of Upper Respiratory Infections in Kittens in a Nursery

- **UV system operated intermittently (2017) URIs reduced 76.6%**
- **UV system operated continuously (2018) URIs reduced 87.1%**

Conducted by

Robyn Jaynes, DVM, Melissa Thompson, DVM, Melissa Kennedy, DVM, PhD, DACVM
Arizona Humane Society

SUMMARY

Objective

To evaluate the effectiveness of an ultraviolet air disinfection system (the “UV system”) on reducing the incidence of upper respiratory infections (URIs) in a feline kitten nursery.

Trial

A three-year retrospective observational field trial at a kitten nursery. Aeraply UV systems were installed and data was collected on the number of kittens diagnosed with upper respiratory infections (URIs). The incidence of URIs was compared with the one-year period prior to installation of the UV system and with all periods when the UV system was off.

Results

URIs in the kitten nursery decreased by 87.1% when the UV air disinfection system was operated continuously for one year, compared retrospectively with the year before the UV systems were installed ($p < 0.029$). URIs decreased 76.6% during the year the UV system was operated intermittently, compared with the year before the UV system was installed ($p < 0.044$).

Study conclusion

Operation of the UV air disinfection systems significantly reduced the incidence of URIs in the kitten nursery while all other controllable factors remained constant. Considering the impact the air disinfection system had, the airborne component of feline respiratory infections may be more significant than previously recognized. Animal shelters may wish to consider UV air disinfection as a possible addition to their infection prevention and control protocols.

Study published

November 1, 2020, issue of *JAVMA* (Vol. 257, No. 9, Pages 929-932)

Risk Management Upper Air UV Field Analysis

Conducted by

Premier Risk Management (February 2021)

Summary

Before recommending Aerapy UV to clients, Premier Risk Management (PRM) conducted air quality tests in their office. Before and after indoor air quality samples were taken to see how Aerapy UV affects airborne fungal spores, smuts, and Myxomycetes. **After testing indoor air quality with Aerapy UV installed PRM found “0% of identifiable spores, smuts, and Myxomycetes” in analyzed area.** PRM found **Aerapy upper air UV equipment with built-in fans (PSF-24) “far superior” to other tested UV products.**

Aerapy and PRM have no financial relationship. Aerapy was not aware the analysis was being conducted until after the results were released.

Additional details

PRM conducted an indoor air quality analysis of Aerapy upper air UV in their offices because they “wanted to feel right about recommending” the equipment. They note that they have performed this type of analysis of UV in work environments on previous occasions. Before installing the upper air UV equipment, they performed a indoor air analysis for airborne fungal spores, smuts, and Myxomycetes to establish the baseline. Areas tested included their interior conference room. Before using Aerapy UV they assessed the air quality in their offices as “already very good” and said they have “very good HVAC usage,” but after Aerapy upper air UV equipment was installed they found “0% of identifiable spores, smuts, and Myxomycetes” in the conference room.

PRM believes Aerapy UV is putting them “ahead of the game” for their risk management clients, the equipment is now in their “toolkit,” and they “definitely recommend it.”

Supporting videos

- Explaining the testing process: <https://youtu.be/qgmWQXfH4qc>
- Discussing the results: <https://youtu.be/oPKaX4OUMIY>