



**Laboratory**  
of **Viruses** Contaminants  
of **Water** and **Food**



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### Summary Report

Evaluation of the efficiency of the air disinfection unit WADU-02, WELLIS (Wellis Co., Ltd.) against Rotavirus under dry conditions

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**REPORT Núm. 2019121202**

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### **Product evaluation**

Product Description: Air Disinfection unit  
Model number: WADU-02  
Brand: WELLIS  
Manufacturer: Wellis Co., Ltd.  
Issue date: 12/9/2019

### **Summary**

The effectiveness of the WELLIS WADU-02 air disinfection unit for the disinfection of viruses was measured against Rotavirus (RoV). The inactivation or decay of infectious RoV was quantified using cell culture (TCID<sub>50</sub> assay) and all tests were done in duplicate. Dry viral suspensions were exposed to the disinfection unit in order to test virus stability over time. Control viral suspensions, not exposed to the disinfection unit, were tested in parallel. The disinfection treatment was able to reduce 99% of the initial concentration of RoV after 2 hour of treatment.

### **Experimental procedure**

RoV is a non enveloped RNA virus transmitted by the fecal-oral route. It infects and damages the cells that line the small intestine, causing gastroenteritis. RoV A, the most common species, causes more than 90% of rotavirus infections in humans. RoV can survive in the environment for days or months maintaining their viability at low temperatures (4°C-20°C) and low pH (3.0). It demonstrated to be relatively stable to inactivation and remain on porous surfaces (cotton clothes) for long periods. For this test RoV strain WA (ATCC® VR- 2018TM) was produced in MA104 cells (ATCC® CRL-2378.1TM).

This experiment was performed for RoV under dry conditions. The air disinfection unit was stored in a metacrilate box (0,064 m<sup>3</sup>). All experiments were conducted at room temperature. One-hundred microliter droplets were disposed over small pieces of glass, dried at room temperature and placed inside or outside the box (control) as it is shown in picture 1.



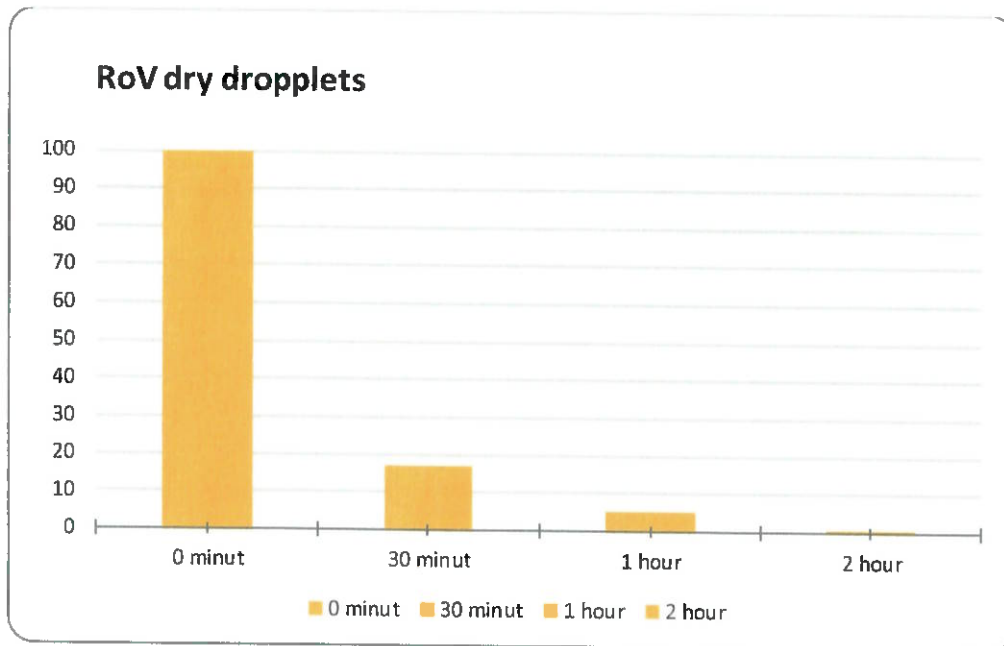
Picture 1: Dry droplets disposed over small glass pieces.

At each testing time viruses were recovered, from the glass surfaces, in culture medium (MEM) and the number of infectious viral particles were quantified by TCID<sub>50</sub> in MA104 cells.

The inactivation effectiveness of the air disinfection unit over RoV dry suspensions are summarized in table 1 and figure 1. Viral quantities are expressed in logarithms

	Time	No treatment	Air disinfection unit (ozone + <i>d</i> -limomene)	log <sub>10</sub> decay	% of decay
DRY	0 minut	9,48E+05	3,00E+04		
	30 minut	6,29E+04	1,08E+04	0,76	83%
	1 hour	1,64E+04	3,39E+03	1,44	95%
	2 hour	1,58E+03	5,00E+02	1,99	99%

Table 1: RoV concentration decay over time under dry conditions.



**Figure 1: Percentages in RoV concentration over time under dry conditions.**

### Conclusion

The equipment, significantly reduce the concentration of RoV under dry conditions. The fecal-oral transmitted virus presented in 2 hours a total decay of  $2\log_{10}$ . The efficiency of WELLIS WADU-02 on aerosols receiving equivalent doses could be expected to be at least equivalent.

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