Rescue Me: Sanitation of Electronic Devices

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Our facility issued electronic tablets to all animal care staff to meet advances in technology. These tablets are used every day in the facility to enter cage-side data regarding animal health as well as communicate with the healthcare and leadership staff. However, these tablets could potentially serve as a fomite and a source of cross contamination.[1]

While there is literature on various sanitation methods for smartphones,[2] we did not find any literature on the use of an accelerated hydrogen peroxide (AHP) based products for the sanitation of electronic devices, which our facility uses for routine sanitation of housing and procedural spaces. Due to the presence of adenosine triphosphate (ATP) in living cells, ATP may be utilized as a marker for assessment of sanitation effectiveness.[3] Collecting ATP is as simple as collecting a swab off the surface sampled. Various methods are used to measure ATP, including bioluminescence via luciferase. The relative light units (RLU) emitted from the swab under optimum conditions are directly proportional to the amount of ATP.[4] We used adenosine triphosphate testing (ATP) to measure the effectiveness of various AHP products. We tested the premoistened wipes (0.5% hydrogen peroxide), a ready to use AHP spray (0.5% hydrogen peroxide), and an AHP Concentrate (4.25% hydrogen peroxide) diluted to a 1:64 ratio using a spray bottle to use at 1, 3, and 5 min contact times.

Figure 1. After the contact time, the device was wiped with a Kim wipe and then swabbed with an ATP swab.

Figure 2. ATP testing was repeated for post-disinfection comparison.

Materials and Methods

The electronic tablets that are used inside the facility by the technical staff were collected. The devices were then divided into three groups, with three tablets in each group. One group was for premoistened wipes (0.5 % AHP), another for ready to use product (0.5% AHP), and another for diluted disinfectant (4.25% concentration diluted to a 1:64 ratio). Once the groups were established, they were then divided further based on contact time; 1 min, 3 min, and 5 min per tablet. Each device was ATP tested before cleaning for a baseline value. The device was either wiped down with one premoistened wipe or misted with one spray and allowed to sit for the specified contact time. To account for contact time for each of the three tablets within each group, a

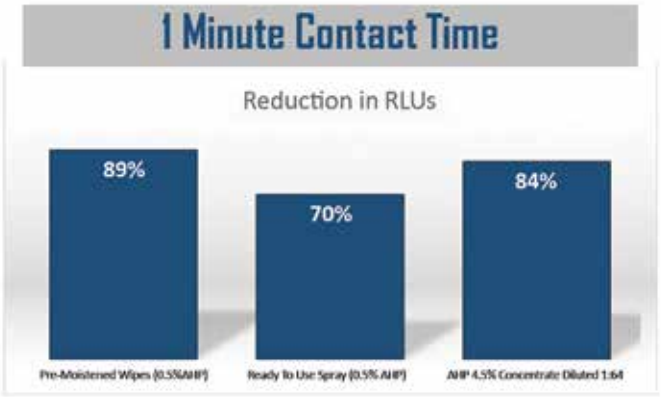

Figure 3. One minute contact time.

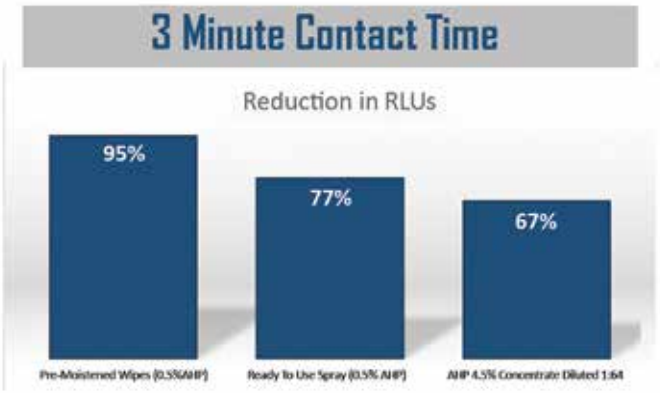

Figure 4. Three minute contact time.

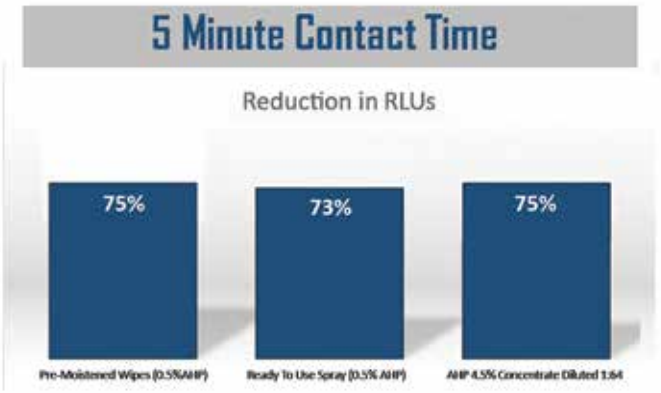

Figure 5. Five minute contact time.

timer was utilized. At the conclusion of the contact time, each tablet was wiped with a Kim wipe (Figure 1). Following the post-wipe procedure, ATP testing was repeated for a post-disinfection comparison (Figure 2).

Results

It was determined that the premoistened wipes had the most significant decrease in relative light units with ATP testing overall at 1- and 3-min contact times (Figures 3 and 4). However, at a 5 min contact time, the premoistened wipes and the diluted concentrate performed equally (Figure 5).

Conclusion

It was concluded that the premoistened wipes were the most effective at reducing the biological residue on the tablets due to the entire surface area of the tablet being covered more uniformly than the spray method. We believe that the shorter contact times were most effective, regardless of the product, because the liquid was not allowed to dry completely. In other words, when any remaining liquid was spread over the surface with a Kim wipe at the end of the testing window, it acted like a premoistened wipe disinfecting the entire surface. The spray method, at the longer contact times, dried in particulates thus not covering the entire surface. Even though all three sanitation methods were effective at reducing the biological residue on the tablets, the premoistened wipes are the most convenient technique for disinfection. Therefore, we believe that the vivarium users are more likely to remain compliant with products that allow a short contact time and are more convenient to use.

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