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ASSESSMENT OF A POSSIBLE RELATION BETWEEN HYGIENE PROTOCOLS MEASURED BY BIOLUMINESCENCE AND THE VIRAL LOAD: AN ORIENTATIONALLY STUDY

V. Geurts [1], *K. Valentine* [1], *S. Hänsel* [2]
[1]*BioChek BV, Smart Veterinary Diagnostics, vgeurts@biochek.com*
[2]*Hygiena Diagnostics GmbH*

Background and objectives

Adenosine-triphosphate is the energy component molecule of all plant and animal cells which can be directly measured via bioluminescence expressed as RLU (relative light units) (Fig. 1.) ATP-tests evaluate hygiene- and sanitation protocols on the spot within 10 seconds.

ATP-bioluminescence detects, microbial cells, food residues, bacteria, fungi and yeast, which might persist after inadequate cleaning. Viruses do not contain ATP. The aim of the orientational study is to assess a possible relation between the ATP levels measured and viral load.

Figure 1

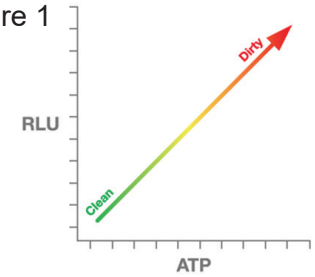
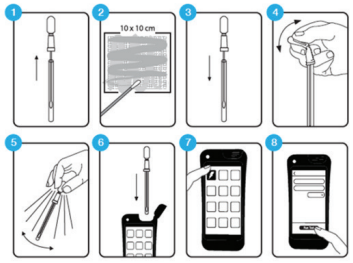


Figure 2



Materials and methods

To investigate a possible relation between the amount of ATP- measured and the viral load of PRRSv, VetAssure™Swabs were used swabbing a defined area of 100 cm2 (Fig.2.).

A sorting panel was divided into 3 compartments which were physically separated by glued slats to avoid cross contamination. Each compartment/group was inoculated with a fixed amount of a PRRS-MLV vaccine. Compartment1 served as a control meaning no cleaning and disinfection. Compartment2 was cleaned. Compartment3 was cleaned and disinfected. Compartments were sampled with VetAssure- and viral swabs on T0:at Inoculation, T1:after the described treatments, T2:45 min after T1. The RLU and the detected viral load are measured via the EnSURE®Touch-luminometer and a quantitative PRRSvPCR(copies/500µl) to assess a possible relationship (Table 1)

Table 1 **Methods and Results**

Timelines / treatments	Compartment 1: control	Compartment 2: cleaned	Compartment 3: cleaned + disinfected
T0: PRRS MLV inoculation + ATP swab before treatment	RLU: 2697 Viral load / 100 cm²: 14155	RLU: 337 Viral load / 100 cm²: 33428	RLU: 353 Viral load / 100 cm²: 56850
T1: ATP swab directly after treatment	RLU: 523 Viral load / 100 cm²: 8375	RLU: 319 Viral load / 100 cm²: <600	RLU: 193 Viral load / 100 cm²: 0
T2: ATP swab 45 min past treatment	RLU: 332 Viral load / 100 cm²: <600	RLU: 282 Viral load / 100 cm²: <600	RLU: 198 Viral load / 100 cm²: 0

Discussion and Conclusion

Although the results are indicative, all groups showed a reduction in RLU and viral load from T0 onwards. The RLU reduction in the control group is likely caused by using a dry clean paper-tissue to ensure that the surface is dry and comparable to the other groups since they were also dried with a clean paper-tissue at T1. Swabbing alone may also cause a reduction in biocontamination. Several trends are seen in this trial. Cleaning and disinfection showed the lowest biocontamination followed by cleaning only. The lower the biocontamination the lower the PRRSv-load indicating a possible relation which justifies an extended study to confirm a statistically significant relation.

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