The **Reference** in **Prevention** for **Animal Health**

HOW TO EVALUATE THE INOCULATION POINT IN PIGLETS FOR HIPRADERMIC®?

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INTRODUCTION

Needle-free vaccination through intradermal injection (NFID) is a less invasive technique and causes less anxiety and pain to the animal compared to other types of vaccination, amongst other benefits (elimination of broken needles, avoidance of iatrogenic spread)[1]. However, this NFID can cause concern in users, regarding the correctness of the vaccine application, due to the difficulty in detecting the inoculation point in a visual inspection in some cases.
Intradermal injection involves the alteration of homeostasis at the inoculation point which would modify the normal thermal distribution of this area. Therefore, a method such as infrared thermography, which can visualize and measure the surface temperature[2] was thought to be able help to easily visualize the inoculation point when vaccinating with a NFID system such as Hipradermic®[3].
The objective of the present study was to test and compare thermographic vs visual inspection as methods of evaluation of the inoculation point when vaccinating with the UNISTRAIN® PRRS vaccine in piglets using Hipradermic®.

MATERIALS AND METHODS

A total of 70 healthy piglets of 4 weeks of age from a commercial PRRS-positive farm was selected. Sixty piglets were assigned to the V group and vaccinated intradermally with UNISTRAIN® PRRS using Hipradermic® (0.2 ml/dose). The other 10 piglets were the non-vaccinated (NV group), but the device had a similar physical contact with the animals to the V group. Visual inspection was performed by analyzing local reactions (inoculation point, papule, inflammation, redness, ulcer and/or scab) before vaccination, after vaccination and 1h, 2h, 4h, 6h and 24h later. For the evaluation of the thermography, the FLIR ONE™ camera for iOS was used at the same times as visual inspection. All the data obtained were processed with FLIR Tools® software.

RESULTS

Thermographic photos allowed the detection of a change in temperature in the anatomical area of the inoculation point in all the vaccinated piglets after vaccination. The change in temperature (difference between maximum and minimum temperature at the inoculation point; Dmax-min) for the V group after inoculation was 4.96±1.35, whilst the NV group did not show this variation (1.98±0.79). One hour after vaccination and later, these differences were not significant between groups (Figure 1).
Visual inspection allowed the detection of the inoculation point, papule or slight inflammation at different times (Figure 1). The highest percentage of vaccinated piglets with local reactions was detected at 2 hours post-vaccination (83.93%) decreasing afterwards.

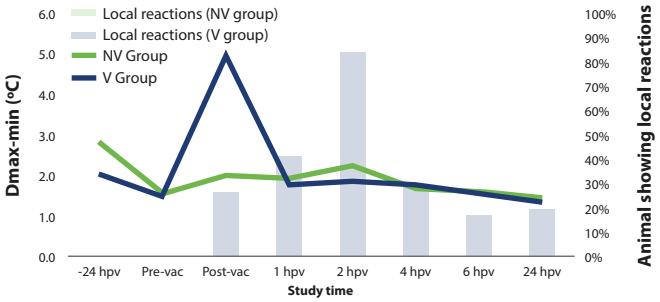

Figure 1. Evaluation of the inoculation point. Percentage of animals with local reaction (bars) and comparison of the difference between maximum and minimum temperature (Dmax-min) (lines) at the inoculation point in vaccinated and non-vaccinated animals at the different time points studied.

CONCLUSIONS AND DISCUSSION

This study compares the use of visual inspection and thermography as a method of detection of the intradermal inoculation in piglets under field conditions. The thermography allowed the visualization of the inoculation point after vaccination by intradermal route as a "thermal footprint" (Figure 2).

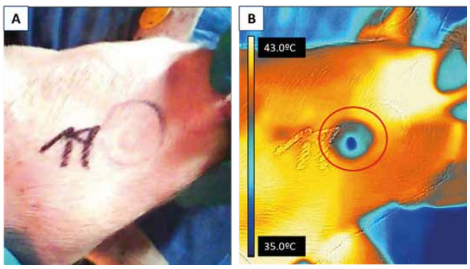

Figure 2. Picture at the time of vaccination. Real image of the piglet (A) and thermography (B) with the thermal footprint (inside the circle).

Thermography has specific new strengths in identifying correct inoculation in all piglets after vaccination (thermal footprint). However, visual inspection should be the chosen technique afterwards, especially at 2 hours post-vaccination. These techniques allow increasing user confidence by visualization of the correctness of the intradermal vaccination.

ACKNOWLEDGMENTS

Scientific Marketing Unit team

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This poster in press belongs to approved proceedings to IPVS Congress 2020 to be held in Brasil, which has been postponed due to COVID-19.

2020-0342