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Main topic : Animal Health

Reduce the real-time polymerase chain reaction time using Magnetic Induction Cycler in veterinary diagnostic

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INTRODUCTION

The real time polymerase chain reaction (qPCR) and the reverse transcriptase real time polymerase chain reaction (RT-qPCR) is widely used in the veterinary diagnostic. Indeed, the obtention of results in one day, comprising, acid nucleic extraction, qPCR, and results analysis, associated with an important sensitivity and specificity are key assets compare to the culture that is the gold standard method. In a diagnostic context where the speed and precision are main issues, a time saving, or a sensitivity gain may be gamechanger. To address those challenges, BioSellal evaluate the Magnetic Induction Cycler (Mic, Bio Molecular System, Australia). This technology allows a faster heat and cooling through the magnetic induction and the fan forced air, thereby allowing it to reduce the qPCR time.

MATERIAL & METHODS

In order to evaluate the Mic input to the veterinary diagnostic, we tried to reduce the run time, while keeping performances, of three BioSellal detection or quantification veterinary diagnostic kits. The selection of those kits in three different lines and with a detection of both DNA and RNA pathogens offer a good vision of the Mic potential. Our "RUMINANT" line is represented by the Bio-T kit® *Mycobacterium avium paratuberculosis*, the "AVIAN" line by the Bio-T kit® Avian & Swine Influenza Virus V2 and the "PIG" line by the Bio-T kit® ASFV. For both, a short thermal program compatible with the Mic qPCR cycler has been designed and compared on different relevant samples with the classical thermal program on an AriaMx® (Agilent) or a 7500Fast (Thermo Fisher Scientific) qPCR cycler.

RESULTS

For DNA detection, on Bio-T kit® *Mycobacterium avium paratuberculosis* and Bio-T kit® ASFV, it was possible to reduce the run time of 20 minutes without impacting the sensitivity. Concerning RNA detection on the Bio-T kit® Avian & Swine Influenza Virus V2 we obtained close performances between a run of one hour in Mic and the classical run thermal program that last one hour and half.

DISCUSSION AND CONCLUSION

Results on different applications for both DNA and RNA detection and on different species samples demonstrate that the Mic Thermal Cycler has the potential to reduce analysis time in the veterinary diagnostic while maintaining performances. Moreover, the compactness of this innovative qPCR cycler offers the perspective of fast field testing.