PRRS virus surveillance: Role of virus sequencing and virus detection by PCR

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INTRODUCTION

Porcine reproductive and respiratory syndrome (PRRS) is a highly infectious disease, endemic in pigs throughout the world. PRRS is caused by a single stranded positive-sense RNA virus enveloped with a high mutation rate leading to greater heterogeneity of the nucleotide sequence between individual strains. The genetic diversity of the virus increases the risk of reduced sensitivity for diagnostic nucleotide detection methods. The aim of the present study was to monitor PRRSV strains throughout Europe using sequencing technologies, in order to update our diagnostic test method.

MATERIALS AND METHODS

Thermo Fisher Scientific established different partnerships to collect more than 100 PRRSV positive samples in more than 10 different countries (Figure 1). Sequencing strategy applied depends on PRRSV viral load and quality of the sampling process: sample collection, storage, shipment (Figure 2).

For 82 samples containing a high/medium PRRSV viral load with a high quality sampling, RNA-Seq or Long Range protocols on PGM instrument were applied in order to obtain whole PRRSV genome sequences.

For 25 samples containing a weak viral load with a poor quality, capillary electrophoresis protocol on GenBank Analyzer was performed in order to obtain a specific target sequence of PRRSV genome.

The diagnostic sensitivity of the VetMAX PRRSV EU & NA assay in development was estimated to 99%.

CONCLUSIONS

PRRSV is a highly mutating, so we consistently monitor PRRSV strains to be sure to offer the most up-to-date PCR solution to enable our customers to work with confidence and detect all strains of concern.

The monitoring of circulating European PRRSV strains, using sequencing technologies enables the sequencing of RNA directly isolated from field samples.

Sequencing approaches offer the possibility to identify new PRRSV strains, increasing the performance of a diagnostic tool for PRRSV detection.

The VetMAX PRRSV EU & NA assay in development is designed to reinforce the efficacy of PRRSV surveillance program in the field, with the detection of the 4 subtypes of the PRRSV European genotype, and a diagnostic sensitivity of 99%.

Thermo Fisher Scientific offers a range of adapted workflows from the sampling, extraction methods to the sequencing solutions.

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TRADMARKS/LICENSING

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