

## VVD-OP-05

### TITLE

IS ORF5 NUCLEOTIDE SEQUENCE ANALYSIS SUFFICIENT FOR TRACING PRRSV-1 STRAINS?

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### CONTENT

PRRSV causes the most significant swine disease worldwide and shows remarkable genetic variation. PRRSV genotyping is being performed mostly based on ORF5 and/or ORF7 sequence analysis. Recent papers indicate that recombination between PRRS viruses may have a high impact of the virus' molecular epidemiology in Europe. Based on the sequence of ORF5 alone the identity of the strain of interest would be misinterpreted and wrong conclusions may be drawn in a diagnostic and epidemiological perspective. Unfortunately, unlike in PRRSV-2, the knowledge about PRRSV-1 recombination frequency and recombination hot spots is largely missing. The objective of this study is to investigate PRRSV-1 recombination based on ORF2-ORF7 sequences.

Thirty-eight PRRSV-1 sequences of ORF2-ORF7 from the Netherlands, as well as 84 PRRSV-1 sequences from Europe, Asia and America, available in GenBank were aligned and analyzed using the RDP4 program to detect potential recombinant viruses in the dataset.

Analysis showed 57 sequences with some recombination evidence. Recombination in 30 sequences was detected by most algorithms incorporated in RDP4 programs. The majority of the detected recombination events were unique and at random positions. In some cases the analysis showed that the position in the phylogenetic tree topologies was ORF dependent, supporting genetic recombination in their emergence. Interestingly, Dutch sequence NL/GD-5-18/2015 clustered with the highly virulent Austrian strain AUT/15-33/2015 in phylogenetic trees constructed from complete ORF2, ORF3, ORF4 and ORF5 nucleotide sequences, whereas in the ORF6 and ORF7 trees it clustered with Lelystad virus. More examples will be presented at the conference.

Our results provide new insights into the role of genetic recombination in PRRSV-1 evolution. Furthermore, it will allow to better assess the value and limitations of ORF5 sequence analysis in epidemiological investigations.