



# CASES OF REPRODUCTIVE FAILURE IN SOWS CHARACTERISED BY AN INCREASE IN STILL BORN AND MUMMIFIED FOETUSES IN DANISH SWINE HERDS

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## Background and Objectives

Porcine Parvovirus (PPV), more correctly named Ungulate protoparvovirus 1 species, is a single-stranded DNA virus classically leading to stillbirths, mummification, embryonic death and infertility (SMEDI)<sup>1</sup>. PPV viruses are prone to constant mutations<sup>2</sup> and are classified into several strains of variable pathogenicity<sup>3</sup>, some of them with very high virulence<sup>4,5</sup>. Here we report two recent, thoroughly investigated case of SMEDI in PPV vaccinated sow herds out of several similar clinical cases in Denmark.

## Material and methods

During months of the Spring and Summer of 2020, these farms demonstrated severe increase in mummified and still-born of, primarily, 1st-parity farrowing's. Farm-1: in average 2.0 mummies per gilt; 2-5 per affected litter; no abortions. Submission to lab: 12 foetuses of 8-23cm (gestational age approximately 50-90 days) from 4 litters. Farm-2: some 1st-parity litters almost all mummified – few live-born; no abortions. Submission to lab: 18 mummies of 6-13cm (gestational age approximately 45-60 days) from 2 litters.

The farms were checked for and demonstrated excellent vaccine management and application. For repro-phylaxis, the gilts were vaccinated twice pre-mating and boosted prior to each subsequent mating by a commercial NADL2-like PPV plus Erysipelas rhusiopathiae plus hexavalent Leptospira spp. combo-vaccine according to the approved product recommendations.



Figure 1 – Litter from a sow infected with a highly virulent field strain and not fully protected by a NADL2-like PPV based vaccine.

## Results

Both farms demonstrated strong PPV-PCR positive findings as the only finding of pathological agents in the foetal

material. Negative PCV2-IHC was demonstrated when investigated.

Application of an alum adjuvated PPV-K22 Ery combo-vaccine reversed the reproductive disorders immediately, in animals coming to term following a previously fully PPV-K22-protected gestational period.



Figure 2 – Litter from a sow infected with a highly virulent field strain and fully protected by a K-22, Kresse-like PPV based vaccine

## Conclusions and discussion

Vaccination against PPV is the one most important repro-phylactic protocol for breeding stock worldwide. However, one must consider that PPV consists of several strains with various pathogenicity and antigenicity. When vaccinating against PPV there are indications that the Kresse-like K22-strain as an antigen confers a wide and efficient clinical PPV protection particularly against virulent strains (figure 1); wider and stronger than NADL-2 and NADL2-like PPV strains (figure 2)<sup>6</sup>. These cases of virulent PPV-field strains breaking the clinical protection of PPV-NADL2-like and PPV-NADL2 based vaccines are in line with the observations in controlled challenge studies<sup>6</sup>. It is, unfortunately, well-known that serological methods are unable to predict the level of protection in a PPV-vaccinated animal<sup>6</sup>. Cell mediated immunity may very well play a central role in PPV protection, but today, clinical protection is the only true measure of PPV-vaccine protection<sup>6</sup>. Conclusively, the safe recommendation on sow-herd PPV-control is the choice of a vaccine containing a well-documented killed virulent field strain, like K-22.

## References

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