PRODUCTIVE AND ECONOMIC IMPACT OF TWO PRRS INCREASED VIRULENCE OUTBREAKS WITHIN A SWINE FARM IN SPAIN

García Flores [1], A.; Pérez Zapater [1], JI.; De Lucas *[2] , L.; Nodar [2], L.

[1]Inga Food S.A., Spain, [2]HIPRA, Amer (Girona), Spain
*Corresponding author: lidia.lucas@hipra.com

Background & Objectives

Starting in 2020 in North eastern Spain, a mosaic PRRSv strain has since been circulating in the country. Commonly known as "Rosalía", it has caused outbreaks of a severity never previously described in Spain. It has been estimated that 18 million pigs have been impacted by Rosalia, characterized by abortion storms in sow herds, sow mortality, stillbirths, high mortality in suckling piglets and weaners[1]. Measuring changes in farm productivity before and after PRRS infection allows quantification of the impact of the outbreaks in order to identify the most efficient strategy for future new infections. In the present study we assessed the productive and economic impact of two outbreaks caused by a PRRS strain of increased virulence on a swine farm in Spain.

Materials & Methods

PRRSV strain movements and their impact were examined on a PRRS unstable 1,780-sow farm, (Together Programme) showing results from January 2022 to October 2023. PCR and ORF5 sequencing from monthly collected serum and/or tongues from preweaning piglets were performed. For the productive analysis, these primary KPIs were analysed using CUSUM graphs: % abortions (AB), piglets born alive/litter (BA), weaned piglets/litter (WP), piglets born alive ratio (BAR), average stillbirths per litter (ST) and return to oestrus (RO). The onset of an outbreak was determined when one of these 6 KPIs deviated by 3 σ and was confirmed by diagnosis. The end of the outbreak occurred when all the KPIs returned to their pre-outbreak values (baseline production). Time-to-Baseline Production in weeks (TTBP) and productive and economic impact of the outbreak were calculated on the basis of this; the last of these was based on the cost of lack of weaned piglets during the outbreak. The differences were tested by a t-test.

Results

An outbreak started in week 38 (2022). A Ct value of 20.7 from serum samples was detected with a highest similarity to the "Rosalia" strain of 97.03% in ORF-5 sequencing. After 20 weeks and before production had fully recovered, a new peak in abortions was observed. Positive PCR samples (Ct value of 24.9) from serum samples showed 94.4% similarity to the Rosalia strain and 98.3% to the previous field strain by ORF-5 sequencing. Marked by two successive outbreaks, TTBP extended to 37 weeks, (figure 1). During this period there was a significant difference (p-val<0.05) in all the KPIs: +0.29%pts AB, - 1.60 BA, -1.22 WP, -3.60 % pts BAR, +0.41 ST and 2.47 % pts RO.

KPI	Baseline production ± SD	Outbreak production± SD	p-value
% abortions*	0.03 ± 0.05	0.32 ± 0.4	0.03
Piglets born alive/litter***	14.08 ± 0.56	12.48 ± 1.33	< 0.001
Weaned piglets/ litter***	12.44 ± 0.77	11.22 ± 0.86	< 0.001
Piglets born alive ratio %*	90% ± 1.49	86.40 ± 7.19	0.01
Average stillbirths/litter	1.56 ± 0.24	1.97 ± 0.96	0.06
Return to oestrus (pts)**	9.46 ± 3.59	11.93 ± 4.59	0.008

Table 1. Comparison of KPIs at site 1 between baseline scenario and high virulence PRRSv outbreak. *p-value < 0.05, **p-value < 0.005, *** p-value < 0.001

The total impact of these 40 weeks measured was calculated as a reduction of 3,710 weaned piglets, resulting in an economic setback of € 63,684 for the farm.

Discussion & Conclusion

This study revealed the high impact of a PRRSv strain of enhanced virulence on a previously positive PRRSv farm and the difficulty in getting rid of it to achieve baseline productivity. Moreover, it showed the importance of establishing a complete and systematic monitoring programme to follow up the implemented measures.

References

1. Martín-Valls, G.E., Cortey, M., Allepuz, A. et al. Introduction of a PRRSV-1 strain of increased virulence in a pig production structure in Spain: virus evolution and impact on production. *Porc Health Manag* 9, 1 (2023). https://doi.org/10.1186/s40813-022-00298-3

Code assign: VVD-PP-158