

EFFICACY OF UNISTRAIN® PRRS VACCINATION IN PIGLETS FOR CONTROLLING PRRSV1 AND PRRSV2 COINFECTION IN A KOREAN SWINE FARM

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INTRODUCTION

Porcine Reproductive and Respiratory Syndrome (PRRS) virus significantly impacts farm productivity through increased abortion rates and potential sow mortality. Additionally, respiratory infections lead to elevated piglet mortality, resulting in substantial economic losses. In Korea, PRRS infections frequently present as co-infections, with both North American and European type strains simultaneously detected within farms. While vaccination represents a key control strategy, its implementation requires careful consideration. This study aimed to evaluate the effectiveness of piglet vaccination in controlling viral spread and reducing mortality rates under field conditions.

MATERIALS AND METHODS

The study was conducted at a Korean swine facility that initially operated as an 800-sow farrow-to-finish farm before transitioning to a 1,700-sow two-site system in November 2023. Following the transition, post-weaning pigs were relocated to external facilities. The study period was divided into three distinct phases: the "Non-Vaccination" period (August 2023 to November 2023) when the farm was PRRS-positive with existing type 2 strain and maintained without vaccination; the "Sow Vaccination" period (November 2023 to March 2024) initiated after a PRRS outbreak with detection of both existing type 2 and newly introduced type 1 strains, during which only breeding herd received vaccination with a live attenuated vaccine (strain VP-046, UNISTRAIN® PRRS); and the "Piglet Vaccination" period (March 2024 to June 2024) when UNISTRAIN® PRRS was implemented both for breeding herd and piglets (at two weeks of age).

RESULTS

Mortality analysis demonstrated significant differences across the three study periods. During the "Non-Vaccination" period, mortality rates were 1.01%, 0.52%, and 0.41% at 50, 55, and 60 days of age, respectively. During the "Sow Vaccination" period, rates were 1.26%, 0.53%, and 0.45% at the respective ages, showing no improvement. Following implementation of the "Piglet Vaccination" period, mortality rates decreased substantially to 0.51%, 0.13%, and 0.14% at 50, 55, and 60 days of age. Cumulative mortality rates through 70 days of age further demonstrated the impact of each strategy: 2.45% during the "Non-Vaccination" period, 2.89% during the "Sow Vaccination" period, and 1.19% during the "Piglet Vaccination" period, indicating that piglet vaccination achieved better outcomes than "Non-vaccination".

Mortality (%) by Timing and Age (A)

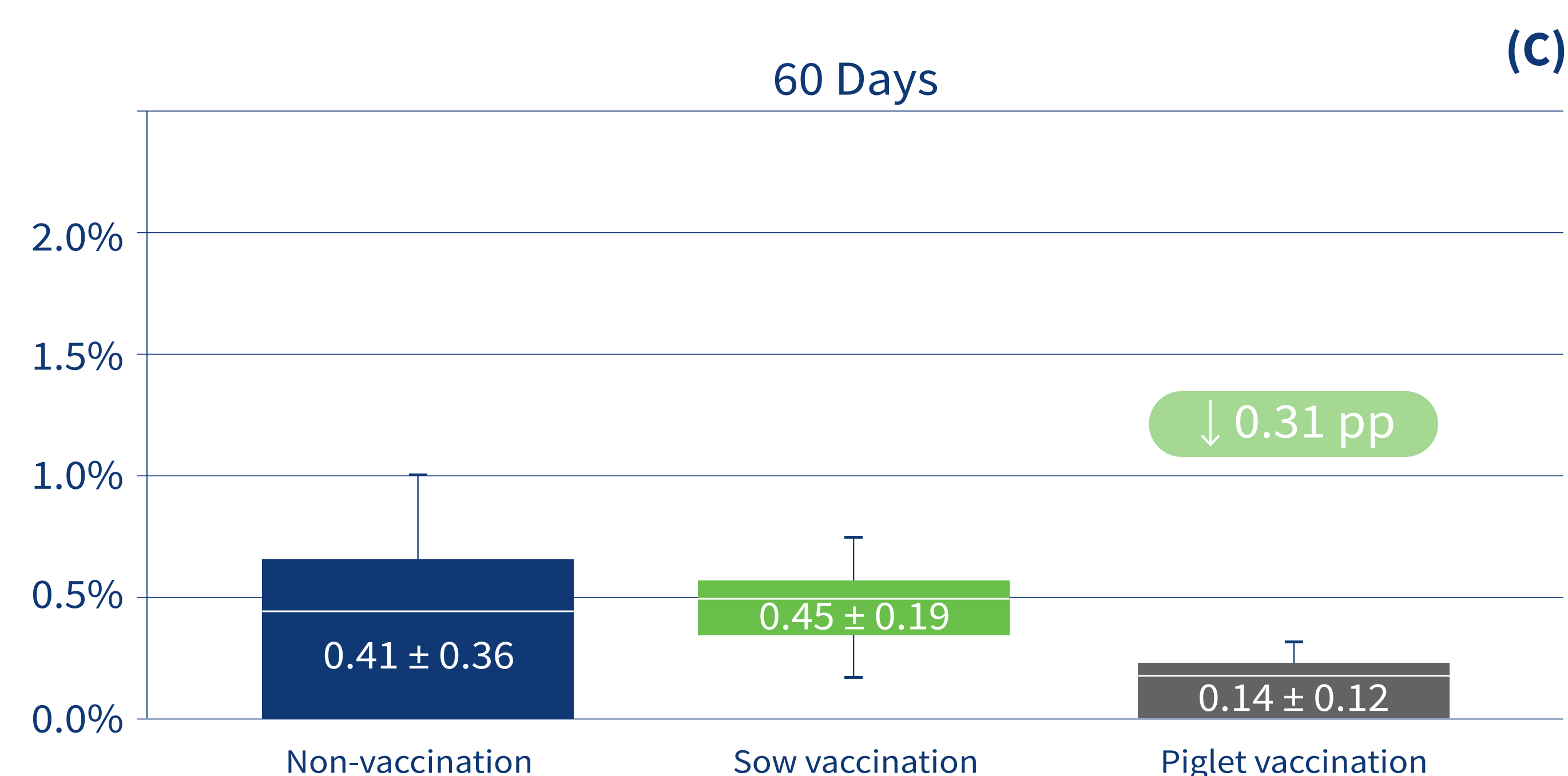
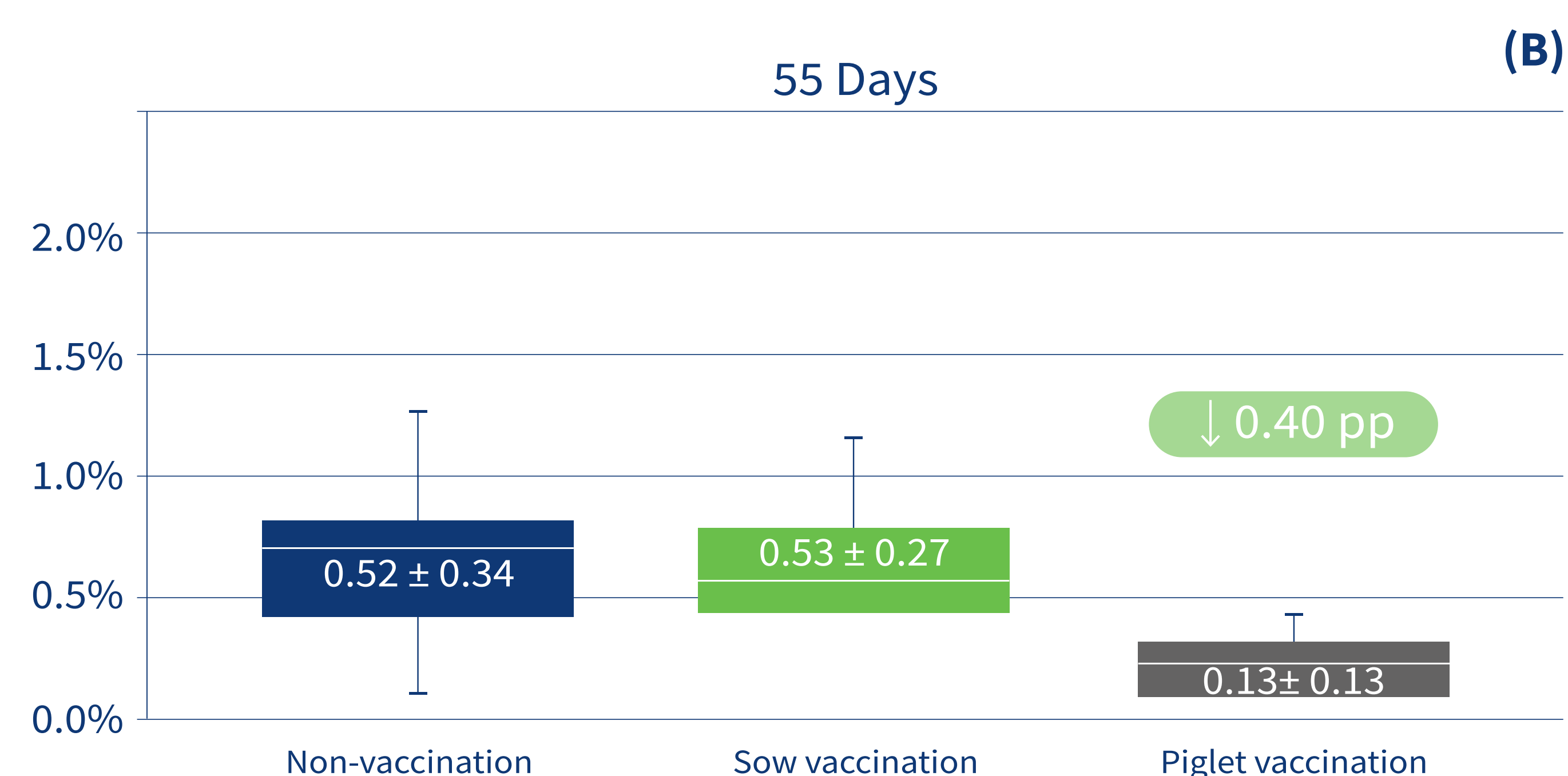
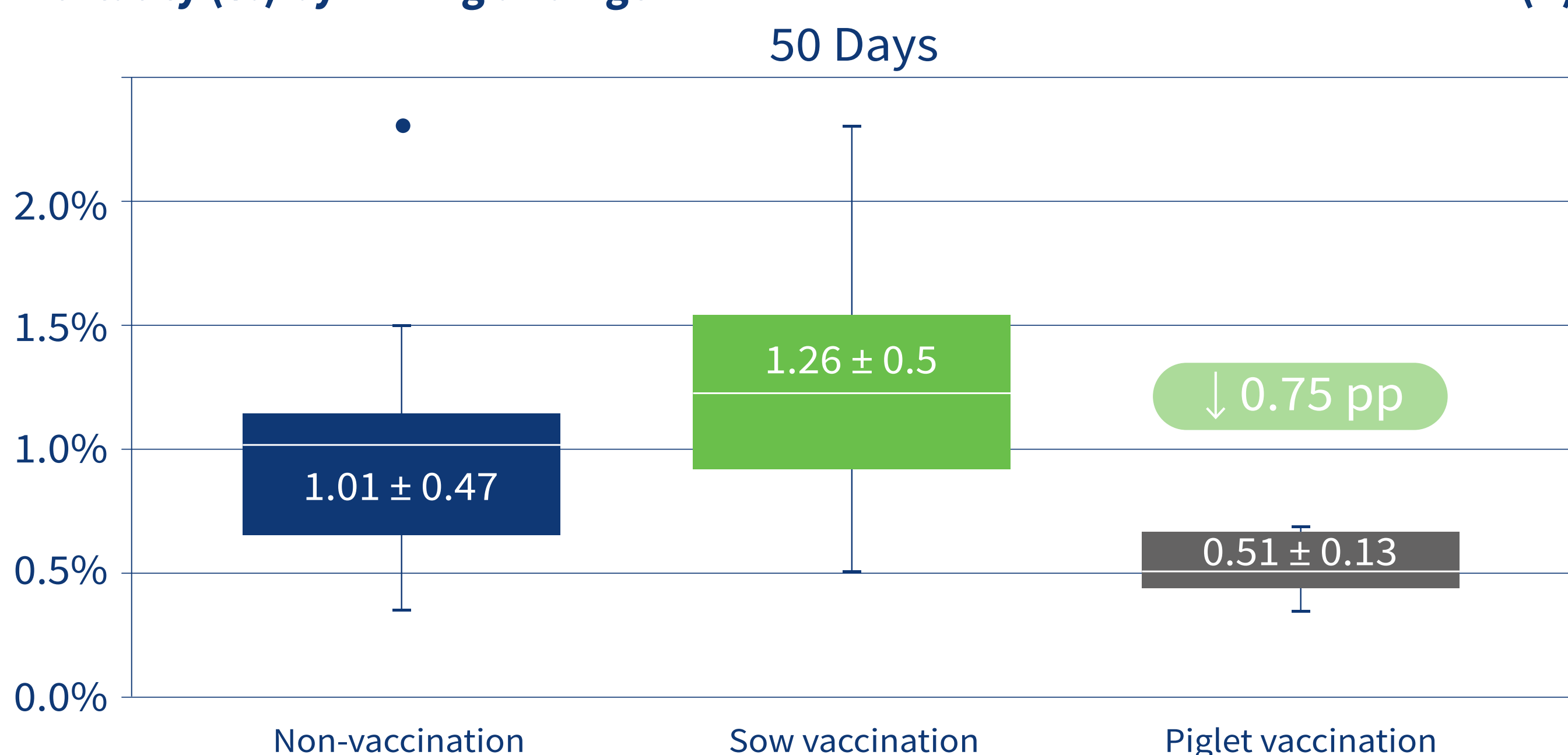


Figure 1. Comparison of piglet mortality rates at three age points (A: 50 days, B: 55 days, C: 60 days) across study periods. The Piglet Vaccination period showed significantly lower mortality rates compared to both Non-Vaccination and Sow Vaccination periods at all age points.

DISCUSSION & CONCLUSION

This case study provides several key insights into PRRS control strategies. First, it demonstrates that sow vaccination alone may be insufficient to reduce piglet mortality following a PRRS outbreak with newly introduced wild strain. The significant mortality reduction observed after implementing UNISTRAIN® PRRS vaccination in piglets suggests that direct piglet immunization is crucial for effective virus control. Secondly, despite UNISTRAIN® PRRS being an European strain-based vaccine, it showed efficacy in a mixed infection scenario involving both North American and European type strains. This finding is particularly relevant for farms facing challenges in vaccine selection during co-infection situations. UNISTRAIN® PRRS' proven safety and cross-protection make it a valuable option in such scenarios. These results provide valuable guidance for PRRS control strategies in farms experiencing mixed strain infections, particularly emphasizing the importance of including piglet vaccination in the control protocol.

REFERENCES

1. Ko, Seong-sik, et al. "Efficacy of commercial genotype 1 porcine reproductive and respiratory syndrome virus (PRRSV) vaccine against field isolate of genotype 2 PRRSV." *Veterinary Immunology and Immunopathology* 172 (2016): 43-49.