

Analysis of acute-phase immune response and reproductive performance following lumpy skin disease vaccination in Hanwoo COWS

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Lumpy skin disease (LSD) is a highly infectious disease that causes significant economic losses in Hanwoo cows. Vaccination is the primary preventive measure; however, concerns remain regarding potential reproductive side effects. This study aimed to evaluate the immune response and reproductive performance following LSD vaccination in Hanwoo cows. A total of 80 cows were sourced from the Gangwon State Livestock Research Institute and the Pyeongchang campus of Seoul National University. Animals were divided into three treatment groups based on the timing of vaccination before artificial insemination (AI): 7 days, 14 days, and 21 days before AI. Ruminoreticular temperature and body activity were monitored, showing some statistically significant differences ($p < 0.05$), though overall changes were minimal. Ovulation rates, assessed via ovarian ultrasound from one day before to four days after AI, showed no significant differences among groups. Similarly, conception rates did not differ significantly. Blood samples were collected on days 0, 3, 6, 10, 15, and 21 post-vaccination to assess complete blood count, serum amyloid A (SAA), and antibody titers. No significant differences were found in white blood cell between groups. Significant were found in neutrophil counts between control, LSD (-21d) groups ($p < 0.05$). SAA levels indicated a low acute-phase immune response. Antibody production was observed from day 10 post-vaccination in all groups. Contrary to previous reports, this study found minimal reproductive or immunological side effects following LSD vaccination. Given that this was a second vaccination following the Republic of Korea's first LSD outbreak in 2023, the mild response may be attributed to prior exposure. These findings provide raw data for future assessments of LSD vaccine safety and its impact on reproductive performance in Hanwoo cows.

Key words : lumpy skin disease vaccine, acute phase protein, antibody titer, ruminoreticular temperature, Hanwoo