

Evaluation of Immune Responses in Beef Cattle Following Vaccination with Live Attenuated and Inactivated Lumpy Skin Disease Vaccines

Kamonthip Senachai^{1,*}, Nongluck Sangkaew¹, Naruepol Promkuntod¹
Roipim Mapongpeng² and Supunsa Mahongchai³

Abstract

Background: Lumpy Skin Disease (LSD) is a transboundary viral disease causing substantial economic losses in beef cattle production. Vaccination is the primary control measure; however, comparative field evidence on the immunogenicity and durability of live attenuated vaccines (LAV) versus inactivated vaccines (IV) remains limited.

Objectives: To compare humoral immune responses and antibody persistence following LAV and IV vaccination against LSD in beef cattle under field conditions.

Methods: A longitudinal field study was conducted on 177 beef cattle were vaccinated with either LAV (n = 93) or IV (n = 84). Serum samples were collected on days 0, 30, 60, 90, and 120 post-vaccination. LSD virus-specific antibody levels and seropositivity rates were compared between vaccine groups over time. In addition, the association between age and antibody persistence was evaluated. Statistical significance was set at $p < 0.05$.

Results: Seropositivity rates did not differ significantly between the groups at days 30 and 60 ($p > 0.05$). However, from day 90 onward, the IV group showed significantly higher seropositivity. By day 120, the seropositivity rate in the IV group was 82.1%, compared to 60.2% in the LAV group ($p < 0.05$). Antibody responses induced by IV were more stable over time, particularly in cattle aged 6–9 years.

Conclusions: Inactivated LSD vaccines induce more durable humoral immunity than live attenuated vaccines under field conditions, supporting their use in endemic or high-risk areas. This information is essential for effective disease control and vaccination optimization at the farm level in beef cattle operations. It is particularly important in areas of Thailand with recurrent outbreaks that require sustained herd immunity.

Keywords: Lumpy skin disease, Beef cattle, Inactivated vaccine, Live attenuated vaccine, Antibody persistence

¹ Veterinary Research and Development Center (Lower Northern Region) Wangthong subdistrict, Wangthong district, Phitsanulok Province

² Phichit Provincial Livestock Office, Nai Mueang Subdistrict, Mueang Phichit District, Phichit Province

³ Sangkhla Buri District Livestock Office, Nong Lu Subdistrict, Sangkhla Buri District, Kanchanaburi Province

* Corresponding author; E-mail: kksenachai@gmail.com