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I-CReST 2025: 001-041 – Differentiating infected from vaccinated animals (DIVA) strategy for Lumpy Skin Disease (LSD) cases in Pahang via real-time PCR assay

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ABSTRACT

Lumpy skin disease (LSD) is an emerging transboundary viral disease listed by World Organisation for Animal Health (WOAH) as notifiable disease due to its significant economic losses and the potential of rapid spread. The etiological agent called lumpy skin disease virus (LSDV); could infect cattle and water buffalo by causing high fever, swollen lymph nodes, cutaneous nodules of 2 to 5 cm in diameter on the head, neck, limbs, udder, genitalia and perineum; lachrymation, reduction in milk production, and sometimes death. In response to a widespread LSD outbreak in Malaysia in 2021 which caused substantial economic losses, the authority has intensified control measures including vaccination program. Since 2022, LSD has become endemic in several states, including Pahang. As a result, distinguishing between naturally infected and vaccinated animals; an approach known as DIVA (Differentiating Infected from Vaccinated Animals) is essential for effective disease management and eradication. Thus, this study aims to evaluate LSD-positive cases in Pahang using a molecular DIVA strategy based on a real-time polymerase chain reaction (qPCR) assay. Following this, clinical samples collected from suspected LSD cases were processed and tested for the presence of LSDV. The confirmed positive samples were then subjected to DIVA qPCR testing to identify the viral strain. Our findings revealed that all positive cases were due to wild-type LSDV, indicating ongoing circulation of the virus in Pahang. We have successfully established a molecular-based method for DIVA LSD via qPCR assay which enables accurate identification of infection sources and supports targeted control interventions. Hence, it is an urge for continuous efforts of LSD awareness, strict regulation on animal movement and import protocol, as well as proper vaccination programs to curb the spread of LSD in Pahang.

Keywords: Lumpy skin disease (LSD); Lumpy skin disease virus (LSDV); Differentiating Infected from Vaccinated Animals (DIVA); Real-time polymerase chain reaction (qPCR)