THE SCIENCE WORLD
A Monthly e Magazine
ISSN:2583-2212
June, 2025 Vol.5(6), 7423-7427

Popular Article

Understanding Lumpy Skin Disease: A Guide for Livestock Owners

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DOI:10.5281/ScienceWorld.15770824

Introduction:

In every village, livestock farming is not just a way of life but the backbone of the community's economy. For farmers, every cow in his or her herd represents not only a source of income but also a symbol of reliability and faith in livestock farming. The Lumpy skin disease (LSD), also known as cattle pox/ nodular dermatitis, is caused by Capripoxvirus, which belongs to the Poxviridae family. The most susceptible to LSD are Cattle (Bulls and heifer calves), Buffalo and some wild ruminants (giraffes, impalas, and musk deer) (1). This disease has a major economic impact, as it affects international trade.

Spread of disease:

Traditionally confined to southern and eastern Africa, LSD spread northwest into sub-Saharan West Africa in the 1970s. Since 2000, it has reached several Middle Eastern countries and, by 2013, extended into Turkey and the Balkans. More recently, LSD outbreaks have been reported for the first time in Georgia, Russia, Bangladesh, India, and China. In India, the first LSD outbreak was reported in 2019 from the state of Odisha. After that, it has spread to multiple states in the country. It has a higher morbidity (5- 45 %) and a lower mortality (1- 3 %) rate (2).

Symptoms & transmission:

LSD virus does not affect humans (non-zoonotic) and its incidence peaks during wet summer conditions, though cases can also occur during winter. Infected animals with LSD experience weight loss, carcass damage, reduced milk production, mastitis, infertility, and abortion. Recovery from LSD can take several months, and even after recovery, the disease often leaves permanent scars, reducing the quality of the animal's skin and fur. Although the virus is present in various bodily fluids and

excretions, the primary sources of infection are sperm and skin sores. Consequently, susceptible animals are mainly infected by blood-feeding arthropods like biting flies, mosquitoes, and ticks (3). The virus remains stable for extended periods in ambient conditions. It can survive in desiccated skin crusts for 35 days, in necrotic nodules for 33 days, and in air-dried hides for at least 18 days. Animals of all ages are susceptible, but calves are more susceptible and develop lesions within 24 to 48 h. The LSD incubation period is 4-14 days and presents in three forms: acute, sub-acute, and chronic. It typically begins with a biphasic fever. In its mild form, the infection shows as one or two nodular lumps appearing within 2 to 3 days of fever onset, along with symptoms like emaciation, ocular discharge, and agalactia. As the disease progresses, painful, hyperemic nodular lesions may develop on various parts of the animal's body, including the muzzle, nares, back, legs, scrotum, perineum, eyelids, lower ear, nasal and oral mucosa, and tail. In severe cases, more than a hundred nodules can cover the entire body, persisting for 7 to 12 days. These nodules are firm and slightly raised from the surrounding skin. And healing of these skin lesions and animal recovery were very slow due to pneumonia, mastitis, secondary bacterial infection, and fly strike in necrotic lesions, leaving deep holes in the body (4).

Diagnosis:

Diagnosing LSD poses challenges due to its unfamiliarity and operational challenges. Its clinical signs can resemble those of diseases like Foot-and-Mouth Disease (FMD), insect bites, pseudo-lumpy skin disease, demodicosis, and hypersensitivity reactions. Tentative diagnosis involves observing nodular lesions on the skin of the eyelids, face, muzzle, nostrils, neck, limbs, and udder region. Confirmation requires virus isolation from skin biopsy samples of LSD-infected animals (5). Both conventional and real-time PCR assays have been developed to conclusively diagnose LSD and distinguish it from other Capripoxvirus diseases.

Figure 1: LSD lesions in cress-breed cattle

Figure 2: LSD lesions in ND cattle

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Published 29 /06/2025

Preventive measures & treatment:

Currently, there is no definitive or effective treatment for LSD infection. To effectively control LSD, preventive measures such as quarantine measurements, restricting animal movements, managing vector movements, and implementing vaccinations are crucial strategies (1). The spread of LSD is largely due to ineffective vaccinations and poverty in rural areas. LSD has reached unprecedented levels, making vaccination the only viable method to prevent its spread in both endemic and newly affected regions. LSD shares over 96% sequence homology with other Capripox viruses, leading to the use of Goatpox virus-based vaccines, as well as attenuated LSD virus vaccines for vaccination purposes (Table 1).

Table 1: Commonly used vaccines registered for use in Cattle against lumpy skin disease (LSD):

Product Name	Virus strain	Target species	Dose, Administration	Manufacturer	Reference
Lumpy Skin Disease Vaccine	LSD Neethling strain	Cattle	1 ml SC	National Veterinary Institute (NVI) Ethiopia	Email: te.tenoihte@tr-ivn
Lumpyvax™	LSD SIS Neethling type strain	Cattle	1 ml SC	Intervet (Pty) South Africa/MSD Animal Health	http://www.msd-animal-health.co.za
LumpyShield-N™	LSD Neethling strain	Cattle	1 ml SC	Jordan Bio-Industries Centre (JOVAC) Jordan	http://www.jovaccenter.com
Lumpy Skin Disease Vaccine for Cattle	LSD Neethling strain	Cattle	2 ml SC	Onderstepoort Biological Products (OBP) South Africa	http://www.obpvaccines.co.za
Bovivax-LSD™	LSD Neethling strain	Cattle	2 ml SC	MCI Santé Animale Morocco	http://www.mci-santeanimale.com/en/
Lumpivax™	Live attenuated LSDV	Cattle	2 ml SC	Kenya Veterinary Vaccines Production Institute (KEVEVAPI)	http://www.kevevapi.org/

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MEVAC LSD	LSD Neethling strain	Cattle	1 ml SC	Middle East for Vaccines (MEVAC) Egypt	https://www.me-vac.com/about
Poxvac™	Bakirköy SPPV strain	Cattle	3 ml SC	Vetal Company Turkey	http://www.vetal.com.tr
Lumpyvac™	LSD Neethling strain	Cattle	2 ml SC		
Poxdoll™	Bakirköy SPPV strain	Cattle	3 ml SC	Dollvet Turkey	http://www.dollvet.com.tr
LSD-NDOLL	LSD Neethling strain	Cattle	3 ml SC		

In India, the Goatpox vaccine has effectively controlled LSD. A new indigenous LSD vaccine, the live-attenuated LSD vaccine (Ranchi strain), named Lumpi-ProVacInd, has been developed by the National Centre for Veterinary Type Culture, ICAR-National Research Centre on Equines (ICAR-NRCE) in collaboration with ICAR-Indian Veterinary Research Institute (IVRI), Izatnagar. This vaccine is yet to be commercially available. Symptomatic management and treatment strategies for Lumpy Skin Disease (LSD) in animals involve strict isolation and veterinary supervision. Affected animals should be separated from healthy ones and closely monitored during isolation. Symptomatic treatment includes administering non-steroidal anti-inflammatory drugs for inflammation, anti-histamines for allergic conditions, and Paracetamol for high fever (3). Antibiotics are used judiciously for secondary bacterial infections like respiratory or skin infections, with strict adherence to dosage and withdrawal periods for milk. Oral multivitamins and, optionally, 0.1% Methylene Blue solution (1 gram of MB powder in 1 liter of water) orally or topically can be considered under veterinary guidance. For adult cows (of approximately 350 Kg body weight): 300 ml at 8 hourly intervals (thrice in a day) for 4 days. For calf: give approx. Half-dose MB solution/preparations may also be used topically. Feeding recommendations include liquid, soft feed, and succulent pasture. Treatment procedures should prioritise oral medication and topical applications to minimise disease spread and contamination risks (6).

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Published 29 /06/2025