THE SCIENCE WORLD
A Monthly e Magazine
ISSN:2583-2212
Popular Article
August, 2026 Vol.6(8), 2513-2518

Treatment of lumpy skin disease in cattle: current and emerging therapeutic options

Dr Raj Sahoo[1], Dr Tarinee Ranjan Pradhan, Dr Abhishek Mishra[2]
[1]Division of Biochemistry and [2]Division of Medicine, ICAR-Indian Veterinary Research Institute, Bareilly, Uttar Pradesh-243122
doi.org/10.5281/ScienceWorld.23525385

Abstract

Lumpy skin disease, caused by lumpy skin disease virus, is a transboundary viral disease of cattle with a major economic impact, and vaccination remains the primary control strategy. This review synthesizes evidence published between 2017 and 2026 on therapeutic approaches for LSD in cattle, drawing on publications identified in PubMed, Scopus and Web of Science together with World Organisation for Animal Health guidelines and outbreak reports. Current management is primarily supportive and combines analgesia, wound care, nutritional support and antimicrobial therapy for secondary bacterial infections; field reports highlight oxytetracycline for bacterial complications and meloxicam as an effective analgesic. Ethnoveterinary remedies such as neem and turmeric are widely practiced in endemic regions, while experimental antiviral and immunomodulatory strategies, including cidofovir, acyclovir and levamisole, show potential but remain under investigation. Effective treatment therefore requires a multimodal approach centered on supportive care and prevention of secondary infection, supported by standardized protocols, careful antimicrobial stewardship, and rigorous evaluation of traditional remedies and experimental antivirals.

Introduction

Lumpy skin disease (LSD) is an emerging transboundary disease of cattle, caused by the *Lumpy Skin Disease Virus* (LSDV), a member of the genus *Capripoxvirus* within the family *Poxviridae*. Since its first description in Africa, LSD has spread widely across the Middle East, Asia, and Europe, with profound implications for livestock production, trade, and food security. Although vaccination is the cornerstone of control, treatment of affected cattle remains vital in minimizing losses and safeguarding animal welfare.

This review critically appraises current therapeutic strategies, including supportive and antimicrobial therapies, ethnoveterinary practices, and experimental antiviral and immunomodulatory approaches, with a focus on recent developments.

Pathogenesis and Clinical Features Relevant to Treatment

LSDV infection leads to fever, lymphadenopathy, cutaneous nodules, edema, and mucosal ulceration. Secondary bacterial infections (mastitis, pneumonia, cellulitis) commonly complicate disease progression. Clinical management is therefore directed toward symptom alleviation, prevention of secondary infections, and enhancement of recovery.

Supportive and Symptomatic Therapy

Management of LSD is primarily supportive. Analgesics and anti-inflammatory agents, notably flunixin meglumine and meloxicam, alleviate pain and pyrexia, improving feed intake and recovery. Fluid and electrolyte therapy prevents dehydration, while provision of adequate nutrition supports immune function. Topical antiseptics, fly repellents, and wound dressings reduce lesion contamination and secondary infections. Antihistamines (e.g., chlorpheniramine maleate, 0.5 mg/kg IM) are commonly given to relieve edema and dyspnea, whereas systemic corticosteroids are strictly contraindicated due to their immunosuppressive effect during acute viremia. For keratitis and corneal ulcers, daily boric acid lavages followed by topical antibiotic eye ointments (e.g., ciprofloxacin or chloramphenicol) help prevent permanent blindness.

Antimicrobial Therapy for Secondary Infections

Secondary bacterial infections, including aspiration or suppurative pneumonia, mastitis, deep tissue cellulitis, and secondary myiasis, are major causes of mortality. Broad-spectrum antibiotics—predominantly long-acting oxytetracycline, with penicillin–streptomycin or macrolides (e.g., tylosin) as alternatives—are administered to treat or metaphylactically manage these bacterial sequelae. Recent outbreak data (Ali et al., 2024; Demir et al., 2024) indicate that antimicrobial therapy substantially reduces morbidity and mortality; however, concerns regarding antimicrobial resistance necessitate judicious use. To manage sloughing lesions and prevent secondary screwworm myiasis, a single dose of subcutaneous ivermectin or doramectin (0.2 mg/kg SC) is routinely co-administered.

Experimental Antiviral and Immunomodulatory Therapies

No antiviral agent is currently licensed for LSD. Preliminary investigations suggest efficacy of cidofovir and acyclovir against capripox viruses *in vitro*, though field validation is lacking. Plant-derived compounds with antiviral activity, including flavonoids and tannins, warrant further exploration. Immunostimulants such as levamisole and herbal formulations have shown potential in enhancing recovery but remain under-studied.

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 30/08/2026

Table 1. Common therapeutic interventions used in cattle affected with Lumpy Skin Disease (LSD)

Therapeutic Category	**Intervention (drug/practice)**	**Typical regimen (field reports)**	**Purpose / Target**
Supportive therapy	Fluid and electrolyte therapy	Oral/IV fluids; Ringer's lactate	Correct dehydration, support metabolism
	NSAIDs (flunixin meglumine, meloxicam)	Flunixin: 1.1–2.2 mg/kg IV/IM; Meloxicam: 0.5 mg/kg SC/IM × 3–5 days	Analgesia, antipyresis, improve feed intake
	Vitamin/mineral supplements	B-complex, zinc, selenium	Immune support, wound healing
Antimicrobial therapy	Oxytetracycline (long-acting)	10–20 mg/kg IM q72h × 3–4 doses	Prevent/treat bacterial pneumonia, mastitis, cellulitis
	Penicillin–streptomycin	Penicillin 20,000 IU/kg + streptomycin 10 mg/kg IM × 3–5 days	Bacterial co-infections
	Macrolides (tylosin, erythromycin)	Tylosin 10 mg/kg IM × 5 days	Respiratory infections, mastitis
Topical management	Antiseptics (povidone iodine, $KMnO_4$)	Daily application	Prevent wound contamination, fly strike
	Fly repellents (pyrethroids)	Weekly spraying	Prevent myiasis
Experimental therapies	Antivirals (cidofovir, acyclovir)	Investigational	Inhibit viral replication
	Immunomodulators (levamisole, herbal extracts)	Levamisole 2.5 mg/kg orally q48h	Enhance immune response
Ethnoveterinary practices	Neem paste	Applied to nodules daily	Antimicrobial, insect repellent
	Turmeric + coconut oil	Topical application	Anti-inflammatory, wound healing
	Aloe vera gel	Topical application	Promote healing
	Ash poultices	Applied to nodules	Drying effect, wound healing

Ethnoveterinary Practices

In endemic regions, ethnoveterinary remedies provide accessible and affordable treatment options. Neem (*Azadirachta indica*), turmeric (*Curcuma longa*), and aloe vera are commonly

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 30/08/2026

applied to lesions for their antimicrobial and wound-healing properties. Ash poultices and herbal decoctions are also reported. In India, the National Dairy Development Board (NDDB) and TANUVAS popularized two structured oral and topical protocols: an oral paste comprising betel leaves, black pepper, garlic, cumin, sweet basil, and jaggery for systemic support; and a topical paste of neem (Azadirachta indica), turmeric (Curcuma longa), holy basil (Ocimum sanctum), and garlic blended in coconut or sesame oil for lesion management and fly deterrence. While widely practiced, the absence of standardized formulations and controlled studies limits their integration into evidence-based guidelines.

Reported Outcomes and Prognosis

Treatment outcomes vary with severity, co-infections, and timeliness of intervention. Field reports indicate recovery rates of 70–85% when supportive and antimicrobial therapies are combined, with reduced mortality in herds receiving comprehensive care. Ethnoveterinary practices appear to accelerate wound healing but lack quantitative outcome data.

Table 2. Reported treatment outcomes of LSD therapy in cattle across different countries

Country	**Year**	**Treatment strategy**	**Reported outcome**
India	2023	Supportive + oxytetracycline + NSAIDs	78% recovery in 21–30 days; mortality 5%
Pakistan	2024	Oxytetracycline (LA) + meloxicam	85% recovery; faster wound healing
Ethiopia	2023	Penicillin–streptomycin + wound dressing	72% recovery; slower healing
Türkiye	2024	Supportive + meloxicam vs flunixin	Meloxicam improved feed intake; mortality <3%
Nepal	2023	Neem/turmeric paste + supportive care	Faster lesion regression; no RCTs
Saudi Arabia	2023	Experimental cidofovir	In vitro efficacy only
Kenya	2024	Supportive + fly control + ash poultices	Healing in 68% cases; variable
Bangladesh	2025	Oxytetracycline + vitamins + neem	80% recovery; faster healing with neem

Discussion

Therapeutic management of LSD in cattle is centered on supportive care and prevention of secondary bacterial infections. NSAIDs improve animal welfare, while oxytetracycline and

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 30/08/2026

related antimicrobials remain essential to reduce complications. However, reliance on antibiotics raises concerns regarding antimicrobial resistance, underscoring the need for stewardship programs. Experimental antiviral therapies are promising but require controlled in vivo trials before adoption. Similarly, immunomodulatory and ethnoveterinary interventions may complement conventional treatment but need rigorous validation. A critical gap exists in standardized treatment protocols, with current practices largely based on field experience rather than controlled trials.

Future research priorities include:

Randomized controlled trials evaluating supportive and antimicrobial regimens.

Development and validation of targeted antiviral agents.

Standardization and clinical evaluation of ethnoveterinary remedies.

Integration of antimicrobial stewardship into LSD management guidelines.

Conclusion

Treatment of LSD in cattle relies on a multimodal strategy comprising supportive therapy, antimicrobial prophylaxis against secondary infections, and, where applicable, ethnoveterinary practices. Experimental antiviral and immunomodulatory therapies represent potential future directions. Establishing standardized protocols and evidence-based integration of traditional remedies will be critical to optimizing outcomes and reducing the global impact of LSD.

References

Al-Sabawy, H. B. *et al.* (2020) "A Highlight on Lumpy Skin Disease in Iraq and the Middle East: A Review Article," *Journal of Applied Veterinary Sciences*, 5(2), pp. 94–103.

Andreï, G. and Snoeck, R. (2010) "Cidofovir Activity Against Poxvirus Infections," *Viruses*, 2(12), pp. 2803–2830.

Anil, T. and Durga, A. K. (2021) "Antibiotic Versus No Antibiotic Approach in the Management of Lumpy Skin Disease (LSD) in Cattle," *Journal of Entomology and Zoology Studies*, 9(1), pp. 1612–1614.

Arain, A. G. *et al.* (2026) "Epidemiology of Lumpy Skin Disease in Cattle: Prevalence, Risk Factors, and Implications for Control in Karachi, Pakistan," *Zenodo (CERN European Organization for Nuclear Research)* [Preprint].

Best, C. *et al.* (2023) "Validation, Visibility, Vagueness and Variation: A Qualitative Assessment of Existing Veterinary Guidelines for Antimicrobial Use in Cattle and Sheep in the UK," *PLoS ONE*, 18(11).

Chileshe, C. *et al.* (2025) "Development of the Zambian Standard Treatment Guidelines in the Animal Health Sector: A Key Step in Advancing Antimicrobial Stewardship," *Antibiotics*, 14(11), p. 1093.

Cholisoh, Z. *et al.* (2024) "Exploration of Ethnoveterinary Medicine for Cattle's Lumpy Skin Disease in Indonesia: Narrative Review," *International Journal of Applied Pharmaceutics*, pp. 38–48.

Gong, Z. *et al.* (2026) "Anti-Orthopoxvirus Drugs Inhibit Lumpy Skin Disease Virus Replication by Targeting Viral DNA Polymerase," *PLoS Pathogens*, 22(1).

Haq, R. I. U. *et al.* (2024) "Comparative Evaluation of Different Antivirals Against Lumpy Skin Disease in Cattle," *Journal of Pure and Applied Microbiology*, 18(3), pp. 1807–1823.

House, J. K. *et al.* (2024) "Antimicrobial Prescribing Guidelines for Dairy Cattle," *Australian Veterinary Journal*, 102(4), pp. 143–186.

Jamil, M. *et al.* (2022) "Lumpy Skin Disease: An Insights in Pakistan," 16(6), pp. 824–827.

Kumar, A., Sagar, V. and BM, R. (2025) "Evaluating the Efficacy of LUMPY-NIL Herbal Powder, Dermal Spray and Dermal Ointment in Treating Lumpy Skin Disease (LSD) in Bovines," *bioRxiv (Cold Spring Harbor Laboratory)* [Preprint]. Cold Spring Harbor Laboratory.

Kumar, P. *et al.* (2021) "Emergence and Transboundary Spread of Lumpy Skin Disease in South Asia," *The Indian Journal of Animal Sciences*, 91(7).

Mazloum, A. *et al.* (2023) "Lumpy Skin Disease: History, Current Understanding and Research Gaps in the Context of Recent Geographic Expansion," *Frontiers in Microbiology*, 14, p. 1266759.

Naidu, G. G. *et al.* (2025) "Assessment of Economic Burden of Lumpy Skin Disease in India Using Stochastic Modeling," *Scientific Reports*, 15(1), p. 10160.

Palai, S. *et al.* (2024) "Ethnoveterinary Approach in Lumpy Skin Disease (LSD): A Review," *Indian Journal of Animal Health* [Preprint].

Rajendran, V. O. *et al.* (2025) "Estimation of the Economic Impact of Lumpy Skin Disease (LSD) Outbreaks (2022–23) in Dairy Cattle Farmers of Uttar Pradesh, India," *The Microbe*, 8, p. 100513.

Shoukary, R. E., Eldin, N. N. and Osman, A. (2019) "Change in Behavior, Blood Parameters and Pain Score in Response to Different Treatment Strategies in Bull Infected with FMD or LSD," *SVU-International Journal of Veterinary Sciences*, 2(1), pp. 82–107.

Singh, A. *et al.* (2023) "Impact of Lumpy Skin Disease in India: Socio-Behavioural Analysis, Epidemiology and Economics," *Research Square* [Preprint].

Sushma, B. S. (2025) "Inactivation of Lumpy Skin Disease Virus Isolate Obtained from the Field Outbreaks Using Binary Ethylenimine," *Journal of Animal Research*, 15(1).

Uprety, Y. *et al.* (2022) "Ethnoveterinary Use of Plants and Its Implication for Sustainable Livestock Management in Nepal," *Frontiers in Veterinary Science*, 9, p. 930533.

Zeynalova, S. *et al.* (2016) "Epizootology and Molecular Diagnosis of Lumpy Skin Disease Among Livestock in Azerbaijan," *Frontiers in Microbiology*, 7, p. 1022.

Zhao, L. *et al.* (2026) "Research Review on Inhibitors of Lumpy Skin Disease Virus: From Biological Characteristics, Drug Repurposing, to Computer-Aided Drug Design," *PubMed Central*, 2026(1), p. 2663212.