

LUMPY SKIN DISEASE: SCIENCE & TECHNOLOGY

NEWS: Lumpy skin disease vaccine developed by Bharat Biotech group firm with ICAR gets CDSCO licence

WHAT'S IN THE NEWS?

India's Biovet has developed Biolumpivaxin, the world's first indigenous vaccine for Lumpy Skin Disease (LSD), a highly contagious viral infection affecting cattle. The vaccine aims to protect livestock, reduce economic losses, and support India's dairy sector, which has faced major LSD outbreaks since 2019.

Lumpy Skin Disease (LSD): Overview

- **Nature of Disease:**
A highly contagious viral disease that affects cattle and buffaloes. Caused by the Lumpy Skin Disease Virus (LSDV), which belongs to the Capripoxvirus genus, under the Poxviridae family.
- **Zoonotic Status:**
LSD is non-zoonotic, meaning it does not spread to humans. Milk from infected cattle is safe for human consumption.

Modes of Transmission

- **Insect vectors:**
Spread through mosquitoes, biting flies, and ticks.
- **Direct contact:**
With skin lesions, saliva, nasal discharge, milk, and semen of infected animals.
- **Contaminated environment:**
Infected fodder and water may spread the virus through oral and nasal secretions.
- **Artificial insemination:**
Transmission possible via infected semen used in breeding.


Symptoms in Infected Cattle

- **Lumps on skin:**
Swollen lymph nodes appear as nodules (2–5 cm in diameter) on head, neck, limbs, udder, genitalia, and perineum. These nodules may turn into ulcers and scabs.

- Systemic signs:
 1. High fever
 2. Nasal and eye discharge, excessive salivation
 3. Loss of appetite, depression, and emaciation (extreme thinness)
 4. Infertility in bulls, abortions in pregnant cows
 5. Damaged hides (affecting leather value)
 6. Sharp decline in milk yield

Morbidity and Mortality

- Morbidity: Varies widely from 2% to 45%, depending on region and outbreak.
- Mortality: Generally low, at less than 10%, but economic impact is severe.



Clinical signs

Incubation period

- Between 4 and 14 days post-infection

Initial period

- High fever (41°C)
- Swollen lymph glands

• Animal may develop large, firm nodules of 5 cm in diameter in the skin

• Depression, anorexia, rhinitis, conjunctivitis, excess salivation


Necrotic lesions can develop in respiratory and gastrointestinal tract

Marked decrease in milk production

Morbidity
Between 5% and 45%

LSD: CAUSE AND EFFECT

- > Lumpy skin disease is a viral disease that affects cattle
- > It is transmitted by blood-feeding insects like certain species of mosquitoes and flies, or ticks
- > It can spread through saliva and contaminated feed and fodder
- > It can spread rapidly in warm and moist conditions
- > It causes fever, nodules on the skin, enlargement of lymph nodes, depression and can also lead to death
- > Causes reduced milk yield, abortion in pregnant animals and sterility in bulls
- > Control options include vaccination and culling of infected animals



Geographical Spread

- Endemic regions:
Common in several African countries, parts of West Asia (Iraq, Saudi Arabia, Syria), and Turkey.
- In India:
 - First reported in August 2019 in Odisha and West Bengal.
 - Two major outbreaks: 2019 and 2022.
 - According to data:

- ~200,000 cattle died
- Millions suffered loss of milk production

Economic and Social Implications

- Milk production losses:
Infected cattle lose appetite, develop mouth ulcers, and cannot produce normal milk quantities.
- Reproductive losses:
Leads to abortions, temporary or permanent sterility, and breeding challenges.
- Livelihood impacts:
Particularly affects small and marginal farmers, causing economic distress due to reduced animal productivity and mortality.

Biolumpivaxin: India's Indigenous LSD Vaccine

- Developer:
Biovet, a subsidiary of Bharat Biotech – known for Covaxin.
- Nature of Vaccine:
 - Live-attenuated vaccine – uses a weakened form of LSD virus.
 - It is a DIVA (Differentiating Infected from Vaccinated Animals) marker vaccine – enables distinguishing naturally infected from vaccinated animals during surveillance.
- Dosage:
 - Single-dose vaccination, given once annually to all cattle and buffaloes irrespective of age.
- Approval:
 - Approved by CDSCO (Central Drugs Standard Control Organisation), India's national regulatory authority.

Significance for India

- Global Milestone:
Biolumpivaxin is the world's first vaccine developed specifically for LSD.
- National Relevance:

- India is the world's largest milk producer, with around 210 million tonnes annually.
- Holds the largest population of cattle and buffaloes globally.
- Strategic Advantage:
 - Reduces dependency on imports for veterinary vaccines.
 - Enhances biosecurity, disease surveillance, and livelihood protection.

Source: <https://www.thehindu.com/sci-tech/science/lumpy-skin-disease-vaccine-developed-by-bharat-biotech-group-firm-with-icar-gets-cdsco-licence/article69201969.ece>