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## Polyherbal formulation's impact on clinical signs of lumpy skin disease in cattle

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### Abstract

The study was conducted in the Bikaner area on the adult crossbred cattle were selected for the current inquiry based on clinical symptoms, and the presence of the Lumpy skin disease virus was confirmed by PCR. Physiological parameters, such as body temperature, heart rate, respiration rate, and ruminal motility, were recorded for every animal during the day and recorded every week. Animals afflicted by LSD were given a crude polyherbal mixture as treatment. Pretreatment mean value physiological measurements reveal considerably reduced ( $p < 0.05$ ) ruminal motility and significantly greater ( $p < 0.05$ ) body temperature, heart rate, and respiration rate. Following therapy, every animal is alive, has recovered from the majority of their clinical complaints, and their physiological parameters have not changed significantly.

**Keywords:** Lumpy skin disease, clinical signs, cattle and polyherbal formulation

### Introduction

Important livestock like cattle and buffaloes have a significant role in the global economy. Lumpy skin disease (LSD) is an acute viral disease, which is caused by lumpy skin disease virus, it causes significant economic losses due to the drastic decrease in feed intake, weight conversion, and milk output, it results in high morbidity and low mortality in cattle. Additionally, it damages the skins of cattle and causes abortions and infertility (RGBE, 2014) [10].

The virus replicates intracellularly within fibroblasts, macrophages, pericytes and endothelial cells leads to vasculitis and lymphangitis in affected tissues (Coetzer, 2004) [5]. Skin lesions are thought to be the main sites of infection since the virus can survive for a long time in lesions or scabs. Calves from their infected dams are resistant to clinical disease for approximately 6 months because of the acquired maternal antibodies (Tuppurainen *et al.*, 2005) [13].

The incubation period of disease in natural condition is between 2 and 5 weeks but in experimental condition, the duration ranges from 7 to 14 days. The LSD has three clinical forms: acute, subacute and chronic form. The disease begins with biphasic fever and then show clinical manifestations in mild form of infection appears as one or two lumps of nodules within 2 to 3 days of onset of fever, emaciation, ocular discharge, agalactia. Later on, nodular lesions, which are painful and hyperemic may be observed on the animal body especially in the skin of the muzzle, nares, back, legs, scrotum, perineum, eyelids, lower ear, nasal and oral mucosa, and tail (Salib and Osman, 2011) [11].

### Materials and Methods

The proposed study was carried out in Bikaner district adult crossbred cattle were screened for LSD on the basis of clinical symptoms before getting selected for the current investigation after that the presence of the Lumpy skin disease virus was verified by PCR. Each animal was monitored during the day to recording of physiological parameter i.e., body temperature, heart rate respiration rate and ruminal motility at the interval of a week.

Lumpy skin disease suspected cattle were later verified by PCR testing for the Lumpy skin disease virus.

Genomic DNA was isolated from whole blood using NucleoSpin® Tissue XS kit (LOT. 2106/004 MACHEREY-NAGEL Germany) as per protocol in manufacturers manual described. Using a pair of primers with the forward primer "ATGTCTGATAA AAAATTATCTCG" and the reverse primer "ATCCATACCATCGTCGATAG," a 570-bp amplicon of highly conserved nucleotide sequences from the ORF 103 gene was amplified.

Animals afflicted by LSD were given a crude polyherbal formulation @ 862 mg/kg body weight for 15 days as treatment.

## Results and Discussion

The clinical profile and general state of health of LSD-affected cattle were tracked at weekly intervals, with the final observation being made during the second week of the treatment regimen, as shown in the table. Pretreatment data recoded of clinical signs shown by LSD affected cattle in all groups and post treatment animals were recovered from major clinical signs while having some mild signs were also present after treatment (Table 1). Cattle in all groups experienced 100% survival rates and while none of the animal displayed pyrexia, anorexia, lymph node enlargement, nasal or lacrimal secretion. Due to weakness and reduced feed intake, two animals from each group of the G-II, G-IV, and G-V groups continue to be emaciated. At the conclusion of the second week, there was no prescapular or prefemoral lymphnode enlargement in any of the animals. Skin lesions (nodules) decreased in size, however upon examination, firm granulation tissue nodules were felt. While five animals had large number of scars lesion with tiny sized nodules all over the body. One animal experienced brisket and forelimb oedema. One animal, had mild dyspnea that may be caused by a subsequent bacterial infection of the respiratory system or lungs. One animal experienced lameness in the lower

forelimbs, which may have been caused by oedema and painful skin sores. While two animals had remained reduced milk production.

**Table 1:** Comparison of clinical observations of pre and post-treatment in LSD affected cattle

S. No.	Clinical Signs	0 day	15 <sup>th</sup> day	
1	Fever	8	0	
2	Anorexia	7	0	
3	Emaciation	5	2	
4	Lymph node enlargement	Prescapular	1	0
		Prefemoral	0	0
		Prescapular+Prefemoral	7	0
5	Skin Nodules	Localized	2	0
		Generalized	6	5
6	Edema	5	1	
7	Respiratory involvement	5	1	
8	Lachrymal	6	0	
9	Nasal secretion	4	0	
10	Lameness	5	1	
11	Reduce lactation	6	2	

The most prevalent signs on clinical examination of the LSD-affected cattle included skin nodules, superficial lymph node enlargement and lack of appetite. Fever, edema in various body areas, Lameness, respiratory involvement, reduced milk production, edema in various body areas and mucosal discharge were other symptoms. Numerous investigations have described the same symptoms in infections that are either natural (Agag *et al.*, 1992; Ahmed and Zaher, 2008; Body *et al.*, 2012; El-Neweshy *et al.*, 2013; Abdallah *et al.*, 2018) [2, 3, 4, 6, 1] or experimental (Osuguwu *et al.*, 2007) [9]. Fever, swollen lymph nodes, confined nodules on the skin that cause severe anorexia, decreased milk production and infertility are the disease's hallmarks (RGE, 2014) [10].

**Table 2:** Mean ± SE values of clinical parameters in healthy and LSD affected cattle at weekly interval.

Parameters	Groups	0 day	7 <sup>th</sup> day	15 <sup>th</sup> day
Rectal Temperature (°F)	G-I	100.63±0.1820 <sup>bA</sup>	100.53±0.2624 <sup>bA</sup>	100.61±0.2787 <sup>bA</sup>
	G-II	103.56±0.1838 <sup>aB</sup>	104.48±0.4156 <sup>aA</sup>	100.93±0.3503 <sup>aC</sup>
Heart Rate (per minute)	G-I	57.88±0.4407 <sup>bA</sup>	58.88±0.4407 <sup>bA</sup>	59.00±0.3273 <sup>bA</sup>
	G-II	81.13±0.3407 <sup>aA</sup>	80.50±0.3780 <sup>aA</sup>	69.38±0.4330 <sup>aB</sup>
Respiration Rate (per minute)	G-I	39.25±0.3660 <sup>bA</sup>	39.75±0.3660 <sup>bA</sup>	41.50±0.3780 <sup>bA</sup>
	G-II	61.25±0.6075 <sup>aB</sup>	71.13±0.6339 <sup>aA</sup>	59.38±0.5748 <sup>aC</sup>
Rumen Motility (per 2 minute)	G-I	2.75±0.1637 <sup>aA</sup>	2.63±0.1830 <sup>aA</sup>	2.88±0.1250 <sup>aA</sup>
	G-II	1.88±0.3407 <sup>bAB</sup>	1.38±0.3037 <sup>bB</sup>	2.38±0.3037 <sup>aA</sup>

1. Mean± SE bearing different superscript (a, b) on between treated and control group differ significantly.

2. Mean and SE with a distinct superscript (A, B, C) within the group and a substantially different time period

The statistical analysis of Rectal Temperature, Heart Rate and Respiration Rate revealed that pre-treatment mean values of LSD affected cattle was significantly higher where ruminal motility was significantly lower ( $p<0.05$ ) as compared to healthy cattle (G I). Post-treatment analysis of Rectal Temperature, Rumen Motility data revealed non-significant difference. Whereas, mean values of Heart Rate and Respiration Rate post treatment showed almost similar value on day 15th compare to healthy group (G-I).

In the present study, mean values of rectal temperature, heart rate and respiration rate in LSD affected cattle were significantly higher while the ruminal movements were decreased in comparison with healthy group of cattle. Similar clinical findings were reported by Jafarsab *et al.* (2022) [7], Kamer *et al.* (2022) [8] and Sandeep (2023) [12].

## Conclusion

It is concluded that given polyherbal formulation was successfully prevent the animal from secondary bacterial infection. And also helps in to reduce complication occurs in disease consequence and animal were recovered clinically.

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