

# Assessment of Marketing Constraints Perceived by Livestock Owners during the Lumpy Skin Disease Outbreak in Rajasthan

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## ABSTRACT

Lumpy Skin Disease (LSD) has emerged as a major transboundary viral infection affecting cattle, creating substantial economic losses and disruptions in livestock marketing systems. Rajasthan was one of the most severely affected states during the 2022 outbreak, experiencing widespread declines in milk production, livestock value, procurement activities, and market operations. The present study assessed the marketing constraints perceived by livestock owners in five critically affected districts, viz., Jaipur, Jodhpur, Barmer, Sri Ganganagar, and Bikaner. A total of 300 respondents were selected through a multistage sampling technique, and data were collected using a structured interview schedule. The severity of constraints was measured using the Mean Per Cent Score (MPS) method. The results revealed that marketing systems were highly disrupted due to the non-availability of accessory equipment for manufacturing dairy by-products, which restricted processing and associated activities. High transportation costs and limited vehicle availability during the outbreak emerged as major barriers to market access. The reduced market price of LSD-affected cattle further intensified economic losses for livestock owners. Limited digital literacy and lack of knowledge regarding online marketing platforms hindered alternative marketing avenues. Additional constraints included supply chain interruptions, reduced procurement of fresh milk by private companies, functioning of livestock markets with minimal activities, restricted access to local markets, and reluctance among consumers to purchase milk from affected cattle. These findings highlight the urgent need to strengthen rural market infrastructure, improve transport facilities, promote digital marketing literacy, and enhance preparedness mechanisms to ensure resilience of livestock marketing systems during future disease outbreaks.

**Key words:** Constraints, Disease outbreak, Lumpy skin disease, Mean per cent score, Rajasthan.

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## INTRODUCTION

The livestock sector is a vital component of the Indian agricultural economy and has exhibited remarkable growth in recent years. The sector recorded a Compound Annual Growth Rate (CAGR) of 12.99% between 2014-15 and 2022-23. Its share in the total agriculture and allied sector Gross Value Added (GVA) increased from 24.38% in 2014-15 to 30.23% in 2022-23, contributing 5.50% to the national GVA during the same period (DAHDF, 2024). India also ranks first in global milk production, accounting for 25% of the world's output. During 2024-25, the country produced 247.87 million tonnes of milk, with a per-capita availability of 485 g/day (DAHD, 2025). Rajasthan, with a livestock population of 56.80 million, is the second-largest milk-producing state, contributing 14.82% to India's total milk output.

Disease outbreaks significantly affect livestock productivity and the functioning of livestock markets, with both short and long-term economic consequences. Lumpy Skin Disease (LSD), first reported in Zambia in 1929, has since spread across international borders (Singh *et al.*, 2023). In India, the first outbreak occurred in Odisha in 2019 (Gupta *et al.*, 2020), followed by a major outbreak in 2022

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that originated in Gujarat and later spread to Rajasthan and other northern states (Sharma, 2022). LSD is caused by the Lumpy Skin Disease Virus (LSDV), a member of the genus *Capripoxvirus* under the family *Poxviridae*. The disease is also referred to as Pseudo-urticaria, Neethling virus disease, Exanthema nodularisbovis, and Knopvelsiekte (Al-Salihi,

2014; Tuppurainen *et al.*, 2017). According to the World Organisation for Animal Health, LSD is an economically significant disease due to reductions in milk yield, hide damage, impaired fertility, and occasional mortality (WOAH/OIE, 2024).

The unprecedented spread of LSDV in India and several other countries has not only affected livestock health but has also disrupted marketing channels, market accessibility, transportation systems, milk procurement activities, and the sale and purchase of animals. These disruptions have created substantial economic hardship for livestock owners, especially in regions heavily dependent on dairy-based livelihoods. Given the considerable marketing disturbances observed during the outbreak, the present study was conducted to identify and analyse the marketing constraints faced by livestock owners during the LSD outbreak in Rajasthan to support the development of farmer-centric market interventions and strengthen preparedness for future disease emergencies.

## MATERIALS AND METHODS

The present investigation was conducted in five districts of Rajasthan, viz., Jaipur, Jodhpur, Barmer, Sri Ganganagar, and Bikaner. These districts were purposively selected as they were the most severely affected during the Lumpy Skin Disease (LSD) outbreak. Jaipur reported the highest number of cases (177,160), followed by Jodhpur (115,864), Barmer (111,204), Sri Ganganagar (95,236), and Bikaner (85,706) (Anonymous, 2022). Two tehsils from each selected district were purposively selected based on the severity of LSD incidence, resulting in the selection of ten tehsils. A comprehensive list of villages under each tehsil was prepared in consultation with tehsil officials and secondary sources. From each tehsil, two villages were randomly selected, yielding a total of twenty villages for the study.

A list of livestock owners was prepared with the help of the Sarpanch and Patwari based on the criteria of possessing a minimum of five large animals and having their herd affected during the LSD outbreak. From each selected village, fifteen respondents were chosen randomly, resulting in a total sample size of 300 respondents. The interview schedule was developed based on the objectives of the study and in consultation with subject experts and members of the advisory committee. Data collected from respondents were compiled, tabulated, and analysed using appropriate statistical methods.

The Mean Per Cent Score (MPS) technique was used as per below formula to rank the marketing constraints associated with the LSD outbreak. Respondents categorized each identified constraint into three levels: Most Serious, Serious, and Not so Serious. These categories were assigned weights of 3, 2, and 1, respectively.

$$\text{MPS (\%)} = \frac{(f_1 \times 3) + (f_2 \times 2) + (f_3 \times 1)}{3 \times N} \times 100$$

Where,  $f_1$  = Number of respondents reporting the constraint as Most Serious,  $f_2$  = Number of respondents reporting it as Serious,  $f_3$  = Number of respondents reporting it as Not so Serious,  $N$  = Total Number of respondents, and the maximum possible score for each constraint is  $3 \times N$

## RESULTS AND DISCUSSION

### Marketing Constraints

A perusal of Table 1 revealed that the lack of availability of accessory equipment for manufacturing by-products was perceived as the most severe marketing constraint during the LSD outbreak, recording the highest MPS value of 93.67 % and ranked first. This indicates that during the LSD outbreak, the lack of essential equipment required for processing dairy by-products limited farmers' ability to add value to milk, which in turn significantly disrupted overall marketing activities. Hike in transportation cost and unavailability of vehicles (MPS = 87.67%) ranked second, suggesting that movement restrictions and increased transport expenses further limited market access. These findings are supported by Nagrale *et al.* (2015) and Kavithaa *et al.* (2020). Reduced market price of LSD-affected cattle (MPS = 87.0%) ranked third, reflecting a sharp decline in the value of diseased animals. Lack of knowledge in using online marketing platforms (MPS = 86.67%) ranked fourth, indicating digital and technological limitations among livestock owners. This is consistent with Godara (2023), who reported that this constraint held the first rank before COVID-19 and shifted to the second rank after COVID-19.

Reduction in milk production of affected cattle (MPS = 83.0%) stood fifth, highlighting the decline in saleable milk. Similar findings were reported by Paikrao (2024). Disruption of the market supply chain (MPS = 75.67%) ranked sixth, showing that the movement of animals and animal products was adversely affected during the outbreak. This matches earlier observations by Godara (2023). Lack of facilities for sale or purchase of animals in livestock fairs (MPS = 74.0%) ranked seventh; this aligned with Nagrale *et al.* (2015), who reported inadequate regulated markets as a major constraint. Livestock markets functioning with minimal activities (MPS = 72.0%) ranked eighth, while limited access to livestock markets (MPS = 68.67%) ranked ninth. Godara (2023) found these constraints comparatively more severe.

People refusing milk from LSD-affected animals (MPS = 63.33%) and private companies stopping procurement of fresh milk (MPS = 58.0%) were ranked tenth and eleventh, respectively, indicating moderate severity. Reduction in milk price compared to pre-LSD conditions (MPS = 55.33%) ranked twelfth and aligned with Kavithaa *et al.* (2020). The closure of market shops (MPS = 53.0%) ranked thirteenth, while disruption of sale and purchase by local vendors or middlemen (MPS = 49.33%) ranked fourteenth. Reduced price of milk (MPS = 45.33%) ranked the lowest among all identified constraints. However, this contrasts with Nagrale *et al.* (2015), who reported



**Table 1:** Marketing constraints perceived by respondents during outbreak of lumpy skin disease

| S. No. | Marketing constraints                                                                     | Most serious F(%) | Serious F(%) | Not so serious F(%) | MPS   | Rank |
|--------|-------------------------------------------------------------------------------------------|-------------------|--------------|---------------------|-------|------|
| 1      | Limited access to livestock market                                                        | 85 (28.33)        | 148 (49.33)  | 67 (22.33)          | 68.67 | IX   |
| 2      | Lack of facilities for sale/purchase of animals as livestock fair                         | 122 (40.66)       | 123 (41.00)  | 55 (18.33)          | 74.00 | VII  |
| 3      | Private companies stopped procurement of fresh milk                                       | 49 (16.33)        | 124 (41.33)  | 127 (42.33)         | 58.00 | XI   |
| 4      | Disruption of market supply chain                                                         | 141 (47.00)       | 99 (33.00)   | 60 (20.00)          | 75.67 | VI   |
| 5      | Reduction in price of milk compared to before the LSD outbreak                            | 38 (12.67)        | 122 (40.67)  | 140 (46.67)         | 55.33 | XII  |
| 6      | Lack of knowledge in using online marketing platforms                                     | 187 (62.33)       | 105 (35.00)  | 8 (2.67)            | 86.67 | IV   |
| 7      | Livestock markets across the country either closed or functioning with minimum activities | 113 (37.67)       | 122 (40.67)  | 65 (21.67)          | 72.00 | VIII |
| 8      | Shops in markets were closed                                                              | 29 (9.67)         | 118 (39.33)  | 153 (51.00)         | 53.00 | XIII |
| 9      | Disruption of sale and purchase by local vendors/middlemen                                | 16 (5.33)         | 111 (37.00)  | 173 (57.67)         | 49.33 | XIV  |
| 10     | Hike in transportation cost and unavailability of vehicles                                | 204 (68.00)       | 81 (27.00)   | 15 (5.00)           | 87.67 | II   |
| 11     | Lack of availability of accessory equipment for manufacturing by-products                 | 243 (81.00)       | 57 (19.00)   | 0 (0.00)            | 93.67 | I    |
| 12     | Milk production of affected cattle was reduced                                            | 170 (56.67)       | 107 (35.67)  | 23 (7.67)           | 83.00 | V    |
| 13     | People refused to use milk from LSD-affected cattle                                       | 70 (23.33)        | 130 (43.33)  | 101 (33.67)         | 63.33 | X    |
| 14     | Reduced market price of LSD-affected cattle                                               | 202 (67.33)       | 79 (26.33)   | 19 (6.33)           | 87.00 | III  |
| 15     | Reduced price of milk                                                                     | 16 (5.33)         | 76 (25.33)   | 208 (69.33)         | 45.33 | XV   |

F = Frequency, % = Per cent, MPS=Mean per cent score

low liquid milk prices as the most serious marketing constraint in the Vidarbha region. The findings clearly indicate that the LSD outbreak not only affected production but also severely disrupted marketing channels, pricing structures, transportation facilities, and value-addition activities, leading to significant economic losses for livestock owners.

Overall, the study highlights that the LSD outbreak profoundly weakened the livestock marketing structure in the state by hampering market access, depressing price structures, and limiting alternative marketing opportunities. Strengthening rural market infrastructure, improving transportation facilities, promoting digital marketing literacy, and establishing resilient market networks are essential strategies for minimizing marketing disruptions during future disease outbreaks. Effective preparedness and farmer-centric support systems will play a crucial role in safeguarding the livelihoods of livestock owners against similar crises.

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