

Epidemiological Incidence of Lumpy Skin Disease in Tajikistan

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1. Summary

In 2023, Tajikistan experienced a serious epidemic of lumpy skin disease (LSD), primarily in regions with high concentrations of livestock. The disease spread to different zones of the republic, reaching its highest point in September - November 2023. Mortality and morbidity varied in different areas, and the seasonality of the disease was associated with the activity of blood-sucking insects. An assessment of the epizootic situation revealed the importance of natural-geographical, climatic and economic conditions for the spread of LSD among cattle. The results of the experimental infection showed that the disease was probably not transmitted to humans, but could cause serious economic losses. Effective disease control and prevention measures, including vaccination and insect vector control, are critical to ensuring animal health and the stability of the country's agricultural sector.

2. Introduction

Among the infectious diseases that reduce the efficiency of livestock farming in Tajikistan in 2023, lumpy skin disease occupies a significant place.

Lumpy dermatitis in cattle (contagious nodular dermatitis, cutaneous bumps, cutaneous nodular rash) is a viral vector-borne disease of cattle characterized by fever, damage to the lymph nodes, nodules at the ends of the eyes and udder. The causative agent of the disease is a DNA virus from the genus Capripoxvirus, family Poxviridae, closely related to sheeppox virus and goatpox virus [3,4].

Bovine lumpy skin disease (LBD) was first diagnosed in 1929 in Central Africa. Soon, the disease with characteristic signs of LSD was confirmed in Albania, Greece, Iran, Israel, Macedonia, Bulgaria, Turkey, Pakistan, India and other countries of the world. In the CIS countries, nodular dermatitis was registered in Azerbaijan (2014), Armenia (2015), Kazakhstan (2015), Georgia (2016), Russia (2016) [1,2] (Figure 1).

3. Materials and Methods

The situation with lumpy skin disease was studied in livestock farms of South-Western Northern Tajikistan and areas subordinate to the republic, where stall-pasture keeping of cattle is practiced. In our research used generally accepted clinical, epizootological, virological and serological research methods.

Enzyme-linked immunosorbent assay (ELISA) was carried out to detect antibodies to LSD virus in accordance with the OIE Guide to Standards for Diagnostic Tests and Vaccines (2014).

Test interpretation was carried out using the Multiskan ELISA instrument. Reagents and primers for ELISA were kindly provided by ID-VET Capripox Double Antigen Multi-Species, A+/CPV-DA-5p, REr CPVDA-5p within the framework of the IAEA project, for which we express our deep gratitude.

Serological monitoring was carried out on 72 samples of blood serum from cattle of various age groups, taken from sick and recovered animals from 4 regions of the country located in different climatic and geographical zones.



Figure 1: Map of the CIS countries

4. Research Results

The first outbreak of lumpy skin disease in Tajikistan was recorded in July 2023 in the border areas with Afghanistan: in the Pyaj, Parkhar and Hamadoni districts of the Khatlon region (Figure 2).

The majority of outbreaks of lumpy skin disease in 2023 were observed in the Kurgantyube regions of the Khatlon region, where 70% of the cattle population in the republic is concentrated.

The disease gradually began to spread to other zones of the republic and reached its highest point in September - November 2023, both in individual and industrial cattle complexes in the Rasht zone.

The last cases of cattle LSD were observed in the Rasht region in December 2023. When analyzing the epizootic situation regarding LSD in the Fayzabad district in June-August 2023, the morbidity rate was 30-40%, and the mortality rate was 2-3%. The incubation period for LSD cattle ranged from 5 days and depended on the susceptibility of the animals and the virulence of the pathogen.

The mortality rate of cattle from lumpy skin disease in the Pyanj region of the Khatlon region of Tajikistan was 55% and 15%, respectively.

The incidence of LSD at the beginning of the outbreak in the M. Hamadoni district of Khatlon region was high in three jamoats: Mekhnatabad, Kakhramon and the village of Moscow, where they border with Afghanistan. It is likely that the lumpy skin disease virus was carried by blood-sucking insects such as mosquitoes, mosquitoes and flies to Tajikistan.

An analysis of the seasonality of the manifestation of LSD in Tajikistan showed that outbreaks of the disease occur, but most often the disease is observed in the summer-autumn period of the year, during the activity of blood-sucking insects. From the clinical and epizootic observations obtained, we can conclude that the main route of spread of the virus is the contact method of infection through blood-sucking insects. Morbidity and mortality from cattle LSD in the Gissar Valley of the republic were 20 and 3%, respectively.

The incidence of LSD in cattle in the regions of the Rasht Valley, where the climate is usually temperate, was observed in November-December of the year. The incidence rate in this region was no more than 10%, and the mortality rate from the number of sick livestock was 3-5%.

In Northern Tajikistan (Sughd region), LSD was recorded only in three districts: B. Gafurov, Kanibadam and Penjikent, as well as in the regions of the Sughd region of the republic. The morbidity rate in cattle in the north of the republic was 15-20%, and mortality was within 3-5%.

The Gorno-Badakhshan Autonomous Region (GBAO), located along the border with Afghanistan, occupies more than 43% of the republic's territory and has a low population and animal density per 1 km². In GBAO, no cases of lumpy skin disease in cattle were observed. Thus, an assessment of the intensity of the epizootic situation showed that one of the main factors influencing the prevalence of the disease is natural-geographical, climatic and economic conditions.

The disease occurred mainly in the warm season (July-November) during the period of biological activity of blood-sucking insects. During outbreaks of LSD in sick animals, an increase in body temperature (40.5-42.00C), discharge from the nose and eyes, enlarged lymph nodes, especially prescapular, refusal to feed, as well as cutaneous nodular dermatitis of various types were noted. shape and size (Figure 3,4).

The number of nodules ranges from ten to several hundred. In lactating cows, nodules of various shapes and sizes often appear on the udder (Figure 4,5,6) during the development of bovine lumpy skin disease.

Sick Cattle with LSD quickly become exhausted and lose milk and meat productivity for a long time.

Pathological changes in LSD are most often observed in the lymphatic systems and respiratory organs.

When the lymph nodes are cut, swelling and juiciness are observed. There is swelling and a nodular rash in the lungs. In a study

of 73 samples of cattle blood serum using ELISA from 7 districts of the Khatlon region and districts of republican subordination, antibodies to the bovine lumpy skin disease virus were detected in 37 animals, which is 48% of the total number of animals (Table 1). The highest percentage of seropositive animals (80%) was observed in the Rudaki region, where there is a large number of cat-

tle and a high level of livestock migration to other regions of the republic.

Serological incidence of the LSD virus was also detected in the Farkhar district of Khatlon region and is 66%. Thus, the results of the study using the ELISA method indicate the widespread distribution of the LSD virus in livestock farms in the Northern and Southern regions of the republic.



Figure 2: Distribution of nodular dermatitis in the Republic of Tajikistan in 2023.



Figure 3: Clinical signs of LSD in cattle



Figure 5: Udder nodules during LSD



Figure 4: Clinical signs of LSD in cattle



Figure 6: Severe form of LSD



Figure 7: Cow with severe form of LSD

Table 1: Results of serological testing for LSD cattle using ELISA

№ п/п	Districts	Number of villages	Research	Revealed	Incidence rate
1	Jomi	2	10	4	40
2	Panj	3	12	8	66
3	Hamadoni	3	10	5	50
4	Vose	1	4	2	50
5	Rudaki	2	10	8	80
6	Faizobod	2	12	4	33
7	Hissor	1	18	6	33
Totally		14	76	37	48

5. Conclusion

Lumpy skin disease (LSD) has become a serious problem for live-stock production in Tajikistan in 2023.

The majority of outbreaks of LSD in cattle occurred in regions with a high concentration of cattle, primarily in the Kurgantuyube regions of the Khatlon region.

The disease has spread to other zones of the republic, including the Rasht zone and the Faizabad and M. Hamadoni districts of the Khatlon region.

Mortality and morbidity from LSD among cattle is vary significantly in different areas, which may be due to climatic conditions, the level of livestock migration and other factors.

The seasonality of the manifestation of LSD is associated with the summer-autumn period of the year and the activity of blood-sucking insects.

An assessment of the epizootic situation indicates the importance of natural geographic, climatic and economic conditions for the spread of the disease.

Clinical signs of LSD include increased body temperature, discharge from the nose and eyes, swollen lymph nodes and various forms of cutaneous nodular dermatitis.

Thus, LSD poses a serious threat to livestock production in Tajikistan, and the fight against this disease requires an integrated approach and coordinated efforts on the part of the Committee for Food Security of the RT.

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