

A SURVEY ON CATTLE LUMPY SKIN DISEASE IN SMALL SCALE HOUSEHOLD OF HO CHI MINH CITY, VIETNAM

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ABSTRACT

In this study was to evaluate the prevalence of Lumpy Skin Disease (LSD), prevalence by breed, age, mortality at disease and clinical symptoms in cattle. Surveyed using a structured questionnaire used to collect information on primary data, at 120 household farms on the outskirts of Ho Chi Minh city, Vietnam, from July 2020 to July year 2021. Results showed that cows infected with LSD were 1212 cows (96%) out of the total of 1259 surveyed cows. The rates of LSD by age under 6 months, from 6 to 12 months, and over 12 months of age were 19.3 respectively; 16; 64.7%. The incidence of LSD cows according to the breeds Golden Cow, Lai Sind, Blanc Bleu Belge (BBB), Charolais, Red Angus, 3/4 Holstein Frisan (HF) such as 24.4; 22.3; 6.5; 9.9; 36.9%. The mortality rates by age under 6 months, from 6 to 12 months, and over 12 months such as 4.7; 0.5; 0%. The survey showed that severe clinical symptoms were full of symptoms in calves under 6 months including fever (100%), nodules on the skin (100%), arthritis inflammation (98%), respiratory inflammation (100%); from 6 to 12 months including fever (100%), nodules on the skin (100%), arthritis inflammation (3%), respiratory inflammation (1%); above 12 months including fever (100%), nodules on the skin (100%), arthritis inflammation (2.9%), respiratory inflammation (0%).

Keywords: *Lumpy Skin Disease (LSD), cattle, capripoxvirus, Vietnam*

Received: 9 September 2022; revised: 3 November 2022; accepted: 29 November 2022.

1. INTRODUCTION

LSD is a highly infectious viral disease of cattle, caused by LSD virus (LSDV) which belongs to the genus *Capripoxvirus* of family *Poxviridae*. LSD is a poxvirus disease of cattle characterized by fever, nodules on the skin, mucous membranes and internal organs, emaciation,

enlarged lymph nodes, oedema of the skin, and sometimes death [1, 2]. The disease is of economic importance as it can cause a temporary reduction in milk production, temporary or permanent sterility in bulls, damage to hides and death due to secondary bacterial infections. LSD was first seen in Zambia in 1929 then spreads into most countries limited to sub-Saharan Africa in the next decades [3], spreading into Botswana by 1943 [4], and then into South Africa, where it affected over eight million cattle causing

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major economic loss. The LSD virus isolated in these first outbreaks was 100% identical to viruses isolated in China (2019) based on the p32 and RP030 genes [5]. The first outbreak of LSD were reported in Lang Son Province of Vietnam, and an official documents has been submitted to Office International des Epizooties (OIE) on 1 November 2020 [5]. LSD occurred in many provinces and cities in Vietnam in 2020. That is why we conducted the study “*A survey on cattle LSD in small scale household of Ho Chi Minh city, Vietnam*”.

2. MATERIALS AND METHODS

2.1. Study area and population

The survey was conducted in suburb around of Ho Chi Minh city including Binh Chanh, Hoc Mon, Cu Chi, Can Gio districts and District 9, 12 from July 2020 to July 2021. Ho Chi Minh city is located in the Southeast, a subequatorial climate with two distinct seasons: the rainy season from May to November and the dry season from December to April of the following year, it has the average temperature in range 25 - 28°C, the humidity levels average 75% throughout the year but are higher during the rainy season. The environment is ideal for the reproduction and growth of blood-feeding arthropods such as mosquitoes, biting flies, ticks, and fleas. Small cattle ranches in the rural areas are often unhygienic, which accelerates the abundance of vectors. Small-scale farmers typically feed their cattle in common pastures,

nearby open fields, or roadside grass, which provides cattle with opportunities to mix with other herds and thus modulate the transmission of the LSD.

2.2. Sample collection

The scale of cow breeding in Ho Chi Minh city is quite large, so the survey will use random sampling and conduct a survey of 120 households. Each household had 2 - 20 animals. Each district (Binh Chanh, Hoc Mon, Cu Chi, Can Gio districts and District 9; 12) surveyed 20 households. Suburban districts should concentrate on cow farmers. To obtain a better understanding of the epidemiology of LSD in the Ho Chi Minh city settings, data were collected in collaboration with the local veterinary services using a standard, well-structured questionnaire. The information recorded in the questionnaire is as follows: Cow infected with LSD; age of LSD: less than 6 months, from 6 to 12 months, over 1 year; breed of cow with LSD (Golden Cow breed, Lai Sind breed, BBB breed, Charolais breed, Red Angus breed, dairy cow breed); the age of cow dies of LSD. Clinical symptoms such as fever, nodules on the skin, arthritis, respiratory inflammation by age under 6 months of age, from 6 to 12 months of age, over 1 year of age.

2.3. Data analysis

Data were analyzed descriptive statistic such as percentages in the ANOVA program of the Minitab software (Minitab 2000) and software Microsoft Excel 2010.

3. RESULT AND DISCUSSION

According to a survey in 120 households with 1259 cows. After the study, we had the result and shown by table 1.

Table 1. Percentage of cow with LSD by surveyed districts

	n = 1259 (cows)	LSD (cows)	Rate (%)
Binh Chanh	107	98	92
Hoc Mon	343	343	98
Cu Chi	385	368	96
Can Gio	86	79	92
District 9	111	111	100
District 12	227	213	94
Total	1259	1212	96

Table 1 shows that a total of 1212 (96%) cows were infected with LSD out of a total of 1259 surveyed cows. In which, district 9 has an infection rate of 100%, Hoc Mon district 98%, district 12 (94%), Cu Chi district 96%, Binh Chanh district (92%), Can Gio (92%).

Small cattle ranches in the rural areas are often unhygienic, which accelerates the abundance of vectors. LSD tends to have a mortality of <10% and a morbidity of 0% - 90% [6].

Table 2. Percentage of cows with LSD by age stage

	Age stage (months)			Total
	<6	6 - 12	>12	
LSD (cow)	234	194	784	1212
Rate (%)	19.3	16	64.7	100

Table 2 showed that the disease occurs at any age. The highest age of cows is over 12 months (64.7%), followed by the age of less than 6 months (19.3%) and the lowest is between 6 and 12 months (16%). Analysis of the age prevalence of LSD revealed that the highest prevalence was observed in ages of > 3 years (21.8%, $n = 36$). This was followed by 1–3 years (16%, $n = 32$) and < 1 year (11.8%, $n = 10$) with no statistically significant differences. The prevalence was 18% and 16.3% in females and males, respectively [7].

Table 3. Percentage of cows with LSD by breed cow

	Breed (cows)					
	Golden Cow	Lai Sind	BBB	Charolais	Red Angus	$\frac{3}{4}$ HF
LSD (cow) n = 1212	0	296	271	78	120	447
Rate (%)	0	24.4	22.3	6.5	9.9	36.9

Table 3 showed that cattle breeds Lai Sind, BBB, Charolais, Red Angus, $\frac{3}{4}$ HF all infected with LSD accounted for 24.4; 22.3; 6.5; 9.9; 36.9%. Particularly for Golden Cow not infected (0%). The most susceptible to the disease was $\frac{3}{4}$ HF (36.9%). Through the survey, we found that the rate of foreign varieties infected with LSD was higher than that of domestic varieties.

Table 4. Percentage of dead cows with LSD by age stage

	Age stage (months)		
	<6	6 - 12	>12
LSD (cow)	234	194	784
Die (cow)	11	1	0
Rate, %	4.7	0.5	0

Table 4 showed that the age groups with LSD mortality rates at the age of less than 6 months, from 6 months to 12 months, and over 12 months are 4.7, respectively; 0.5; 0%. In which, the mortality rate was highest for the period under 6 months old (4.7%), the lowest for the age group over 12 months old (0%).

On July 13, 2020, Ministry of Agriculture and Rural Affairs of China officially announced 7 LSD outbreaks in 6 provinces (Fujian, Jiangxi, Guangdong, Anhui, Zhejiang) in southeast China. It was noted two

independent LSD outbreaks were determined in Jiangxi. The 7 LSD outbreaks occurred between June 2 and July 7, leading to 55 infection cases and 6 death cases. On July 7, 2020, a LSD outbreak affecting 36 cattle individuals with one death case was announced in Taiwan Island. As of now, a total of 9 LSD outbreaks were reported in 7 provinces in China, infecting 156 and killing 7 cattle. The total morbidity and mortality in the 9 outbreaks were 19.5% (156/801) and 0.9% (7/801) respectively. The morbidity and mortality in each of the separate outbreaks

ranged 6.6% - 100% and 0% -16.7% respectively t20200715_6348686.htm) [8].
(<http://www.xmsyj.moa.gov.cn/yqfb/202007/>

Table 5. Percentage of LSD with clinical symptoms of fever, nodules on the skin, arthritis inflammation, respiratory inflammation by age stage

Age stage (months)	Clinical Symptom				LSD (cows)
	Fever	Nodules on the skin	Arthritis inflammation	Respiratory inflammation	
<6	234 (100%)	234 (100%)	231 (98%)	236 (100%)	n = 234
6 - 12	194 (100%)	194 (100%)	6 (3%)	2 (1%)	n = 194
>12	784 (100%)	784 (100%)	7 (2.9%)	0 (0%)	n = 784

Table 5 showed that all age stages of LSD infection showed fever, nodules on the skin (100%). The clinical manifestations of arthritis were highest at the age of less than 6 months (98%), the lowest at the age of over 12 months (2.9%). For clinical symptoms of respiratory

infection, the highest was in the period of less than 6 months old (100%), the lowest was in the age of over 12 months (0%). Through the survey, we found that clinical symptoms were severe in the period under 6 months of age.

Table 6. Figure clinical symptom of LSD

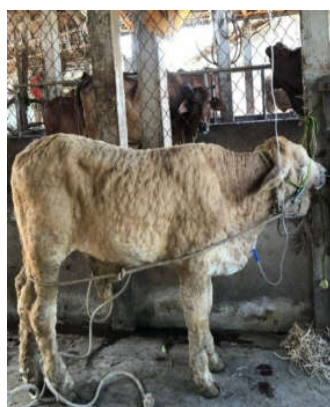


Figure 1. Nodules on the skin



Figure 2. Respiratory inflammation

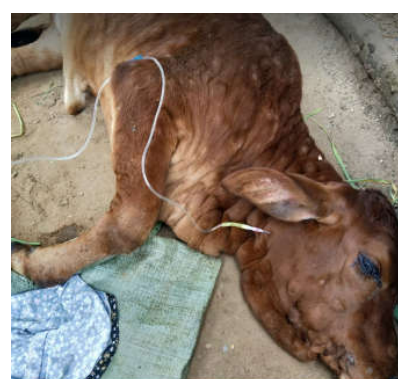


Figure 3. Arthritis inflammation

Table 6 showed the clinical symptoms in calves under 6 months of age. When calves are infected with LSD, there are all clinical symptoms such as: fever, nodules on the skin, arthritis inflammation, respiratory inflammation.

4. CONCLUSION

This study showed that it is LSD that infects all age groups. But causing severe clinical problems as well as causing death at the age of less than 6 months is 100; 4.7%.

ACKNOWLEDGMENTS

We would like to gratefully acknowledged of cow farmers in Ho Chi Minh city provided the information. This work was supported by Mr. Hoai is a Veterinary technician from the Center for Research and Transfer of Science and Technology, Nong Lam University, Ho Chi Minh city for supporting to take information.

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