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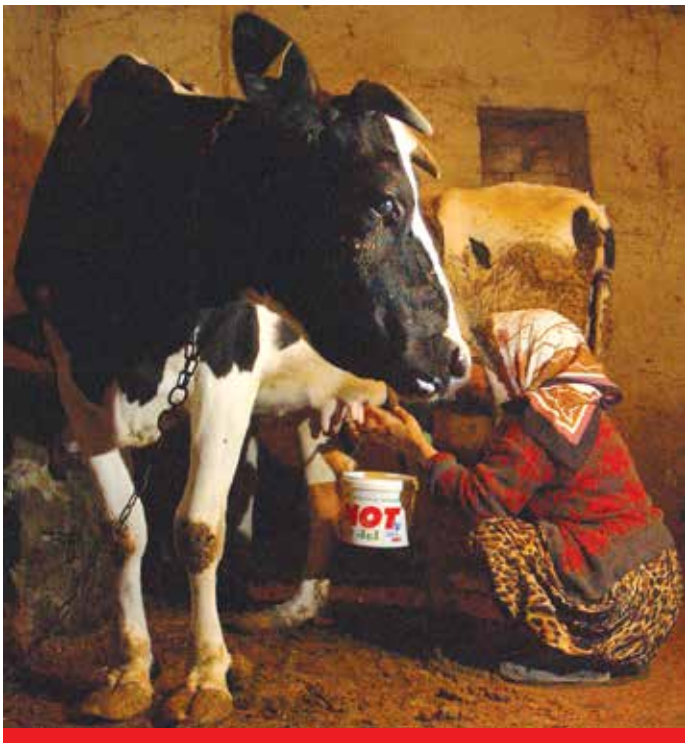

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SITUATION

Emergence of Lumpy Skin Disease in Bulgaria: epidemiological situation, control and eradication

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INTRODUCTION

The first report of lumpy skin disease (LSD) in Bulgaria was made on 13 April 2016, and within three months the disease had spread throughout the country. The national strategy for limiting and controlling the spread of LSD included early detection, prompt implementation of the total stamping out policy and vaccination. In view of the several transmission pathways, strict controls of cattle movements, intensified clinical surveillance, vector control and disinfection were also applied, supported by education and awareness campaigns.

METHODS AND RESULTS

Bulgaria was the second European Union member country to be affected by LSD after Greece, which was first observed on 13 April 2016 in two cattle farms about 5 km apart in the Haskovo region 80 km from the border with Greece and Turkey: in all, 217 outbreaks were recorded in 17 of Bulgaria's 28 regions and confirmed by the National Reference Laboratory for Capripox viruses using real-time and conventional PCR laboratory diagnostic techniques (see chapter 2.4.13 of the *OIE Terrestrial Manual* and the standard operating procedures (SOPs) of the *OIE Reference Laboratory on Capripoxviruses* published by the Pirbright Institute in the United Kingdom of Great Britain and Northern Ireland (UK)). The virus was also studied and sequenced in the Kimron Veterinary Institute in Israel and classified as an Egypt/Middle East strain.

Following the incursion of LSD into Greece in 2015, the livestock population in Bulgaria was subjected to intensified surveillance. Because it was considered that these index cases had been detected relatively early, the probable time of arrival of the LSD vector was taken to be the second half of March. The epidemiological investigation indicated that the source of infection was vector transmission, but it did not rule out illegal introduction of infected animals.

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Bulgarian landscape and cattle

Figure 1: Geographical distribution of LSD outbreaks in Bulgaria in 2016
Source: BFSA

Clinical signs observed in the primary outbreaks were generally confined to high body temperature and skin nodules. Most of the outbreaks were detected in the south-western regions bordering Greece, the former Yugoslav Republic of Macedonia and Serbia. The problem peaked in May, with 92 outbreaks of LSD in 52 villages, after which there was a gradual decline to the end of June, when vaccination coverage had reached 80 percent; the last outbreak was confirmed on 1 August. Figures 1, 2 and 3 show the

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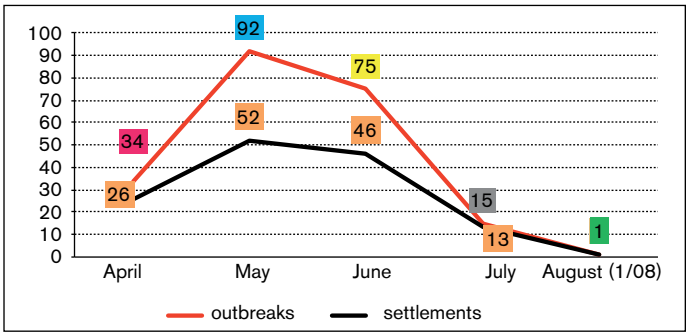

Figure 2: Number of LSD outbreaks and affected villages, per month in Bulgaria

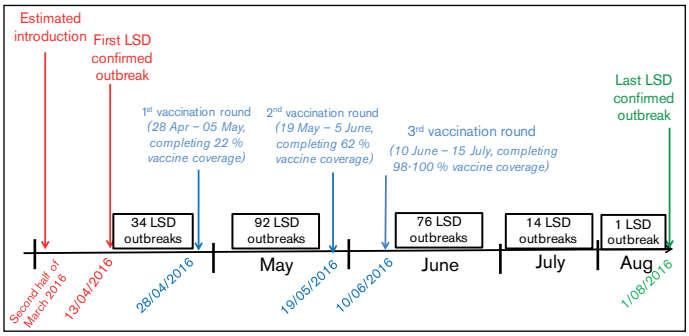

Figure 3: Timetable of LSD situation in Bulgaria

Figure 4: Intensity of LSD outbreaks in Plovdiv, Stara Zagora and Haskovo regions near the Maritsa River, Bulgaria

Figure 5: Intensity of LSD outbreaks in Blagoevgrad region near the Mesta River, Bulgaria

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Figure 6: Severe large skin nodules of the head, neck, udders and tail area around the perineum; genital and ocular discharges

Figure 7: Geographic distribution of LSD outbreaks in Bulgaria, by herd size

distribution of cases, the LSD outbreak curve and the timetable of the outbreak in Bulgaria.

The highest intensity of LSD was observed in holdings in areas with high abundance of vectors along major rivers and watercourses in Bulgaria. Animals were infected in locations up to 5 km away from these (see Figures 4 and 5).

There were 2 814 head of cattle in the affected herds, of which 366 were observed with clinical signs of LSD. The estimated population infection rate was 0.41 percent of the total cattle population. The morbidity rate was 13 percent with a mortality rate of less than 1 percent among the susceptible animals in each outbreak. These rates were observed before immediate stamping out was implemented. Of the affected herds, 53 percent were dairy, 29 percent were mixed dairy and beef, and 18 percent were beef only.

As the outbreak progressed, the clinical signs observed in cattle affected by LSD were lethargy and weakness, reduced milk production, high temperature, skin nodules, nasal discharges and salivation; in a few cases ulceration and scabs were observed (see Figure 6).

The units affected by LSD were mainly small farms of the "backyard" type, where one to ten animals were kept in conditions of low biosecurity (see Figures 7 and 8). In the region of Blagoevgrad, for example, 114 of the 217 outbreaks were detected, of which 81 percent occurred in small farms with five cattle or fewer.

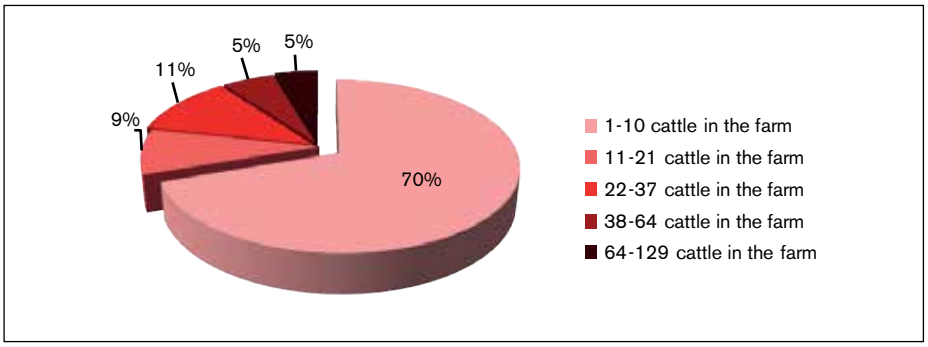

Figure 8: LSD outbreaks in Bulgaria by herd size

CONTROL AND ERADICATION MEASURES

The Bulgarian Food Safety Agency (BFSA) correctly notified OIE and the European Union of the outbreaks, and managed the disease according to EU Council Directive 92/119/EEC, followed by Commission Implementing Decisions 2016/645 and 2016/1183, which set out the safeguard measures for LSD in Bulgaria and the vaccination programme. The total stamping out strategy was implemented in every laboratory-confirmed outbreak, and the carcases were immediately buried on-site. Stamping out was completed within one week of laboratory confirmation in 96 percent of the outbreaks. Other control measures included restrictions on the movement of susceptible livestock, including small ruminants in the case of mixed farming, enforced biosecurity measures on the farms, and intensified clinical surveillance over the entire country. In addition to the measures to eliminate vectors on cattle farms, the BFSA initiated an insect-control programme over 2,790,125 ha along major rivers and in valleys and paddy fields considered to be risk areas.

A vaccination programme was implemented in conjunction with the control and eradication measures. First, ring vaccination was implemented in 20 km zones around each outbreak and in regions considered to be at risk; this was subsequently extended to blanket vaccination of the whole cattle population in Bulgaria in view of the spread of the disease in the Balkan Peninsula. Vaccination was conducted in three rounds in two and a half months, using live homologous vaccines. The Neethling strain of LSD vaccine produced by Onderstepoort Biological Products (OBP) was used for the first and third ring vaccination programmes; the Lumpyvax (SIS type) vaccine made by MSD Animal Health, Intervet, South Africa was utilized for the second vaccination round, as set out below and in Figure 9:

- First round of vaccination – 18 April to 5 May: 150 000 doses of OBP from the EU bank (Neethling strain) administered in the areas round the LSD outbreaks at that time.
- Second round of vaccination – 19 May to 5 June: 275 000 does of Intervet (SIS-type) covering the rest of the southern areas and the north-western areas.
- Third round of vaccination – 10 June to 15 July: 350 000 doses of OBP used in the rest of the country; 100 percent vaccine coverage.

Of the laboratory-confirmed cases, 21 percent of the animals developed typical LSD clinical signs between 3 and 21 days after vaccination. These were regarded as field cases that had been infected prior to vaccination.

To protect wildlife, non-invasive sampling and surveillance for LSD were carried out in areas where the disease had been confirmed in domestic cattle. There is no evidence so far that the LSD virus has affected red and fallow deer.

Awareness and education were particularly important aspects of LSD prevention and control. Working groups, seminars and "cascade" training sessions have contributed to the high level of preparedness and commitment among Bulgarian veterinarians working to prevent LSD and conducting surveillance. Various training materials and leaflets were used to raise awareness among farmers, and a dedicated web link and emergency phone number were set up to enable daily communication with farmers and other stakeholders.

CONCLUSIONS

- Transmission and long-distance spread of the LSD virus could be minimized through surveillance, rapid laboratory confirmation, prompt implementation of total stamping out, safe destruction of infected animals and enforced control and movement restrictions.
- The disease is controlled by coupling the total stamping out strategy with mass vaccination covering at least 85 percent of all herds.
- Further field monitoring is required to investigate quality, safety and adverse reactions after administration of the SIS-type and Neethling strain vaccines.
- Enhanced preparedness and capacities among veterinarians, awareness campaigns and daily communication with farmers and stakeholders are essential aspects of an LSD warning and early detection system.
- Because Bulgaria is known for its wildlife, the study of the mechanical transmission of the LSD virus and the role of wild animals as potential reservoirs of the virus should be continued. [360]

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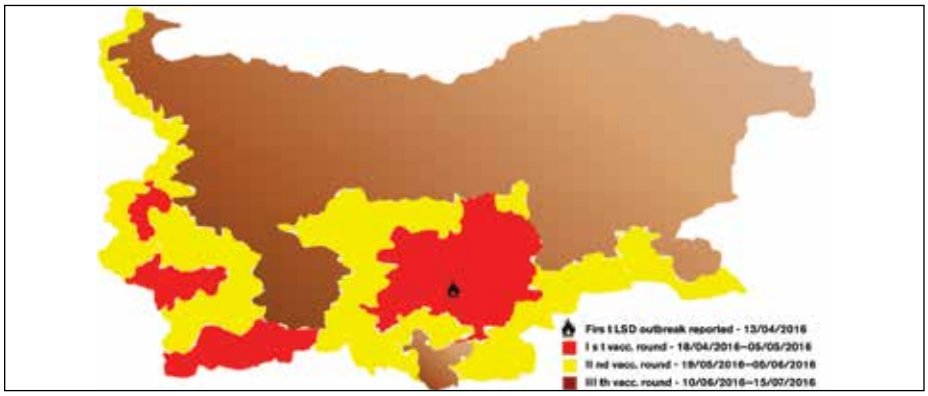

Figure 9: Map of Bulgaria showing the areas covered and timetable for each vaccination round