



GF-TADs

GLOBAL FRAMEWORK FOR THE
PROGRESSIVE CONTROL OF
TRANSBOUNDARY ANIMAL DISEASES

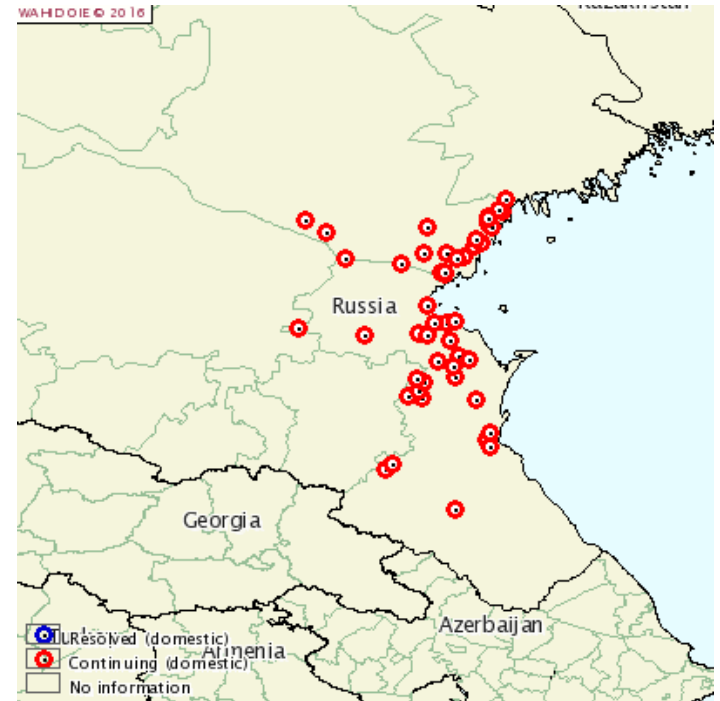


**Standing Group of Experts on Lumpy Skin Disease
in Europe**
under the GF-TADs umbrella

First meeting (LSD1)
Brussels, Belgium, 4-5 July 2016

Lumpy skin disease - epidemiology
LSD Expert: Dr Eeva Tuppurainen

Current geographical distribution



Most recent outbreak reported in Kosovo 24th June 2016 in the village of Zhujë within the municipality Kamenica adjacent to the Serbian border and on 28 Jun 2016 the Kalmykiyan Republic, Russia



Epidemiology of LSD

- Morbidity rate varies between 5 to 45% and mortality rate usually remains below 10% - Both rates can be considerably higher when an outbreak occurs for the first time in naïve cattle populations
- European high-producing and thin-skinned cattle breeds are highly susceptible
- Dairy cows at peak of production are most severely affected
- No carrier stage - Affected animals will eventually clear the infection
- Silent infections occur – some of the animals become viraemic but do not show any clinical signs (in experimentally infected cattle approximately 1/3 show severe, 1/3 mild and 1/3 subclinical disease)
- Both sexes as susceptible
- Age?



Typical for LSD outbreaks

- In endemic regions LSD outbreaks occur in epidemics with several years between the outbreaks
- Seasonal outbreaks – where the virus resides during the time of minimal or no vector activity
- Outbreaks often along the cattle transport routes and watercourses
- Historically LSDV is considered to be host-specific affecting cattle and water buffalo
- Some wild ruminants in Africa are known to be susceptible , no data available on susceptibility of European species
- Sheep and goats are unlikely to play any role as a reservoir – needs to be confirmed



Gaps in current knowledge

- Natural resistance occurs in cattle – some animals do not get infected at all - **A knowledge gap**
- Animals that recover from natural infection are resistant to reinfection – is the protection complete or are they protected from severe infection - **A knowledge gap**
- How long does the passive immunity protect calves born to naturally infected or vaccinated cows - **A knowledge gap**
- No research data available if young calves originating from unvaccinated mothers and vaccinated initially at the age of less than 3 months should be revaccinated or not - **A knowledge gap**



Modes of transmission

- Direct contact is considered to be relatively ineffective mode of transmission but may occur
- Affected animals excrete the virus into saliva, eye and nasal discharge
- Infection can be obtained through contaminated feed or water, licking stones, mutual grooming between animals
- Scabs contain high titres of virus and are shed to the environment by infected animals with skin lesions
- Virus is stable and remains well protected inside dried scabs for long periods of time



Other modes of transmission

- LSDV is known to persist in semen of infected bulls
- Natural mating or artificial insemination may be a source of infection for females
- In the field, infected pregnant cows are known to give birth to calves with skin lesions
- Iatrogenic transmission may happen when already infected herds are vaccinated or veterinary treatments are administered without changing needles between animals.



Transmission by vectors

- Outbreaks of LSD are more common during hot and humid seasons associated with an abundance of active vectors
- The most important arthropod vector is likely to vary between affected regions, depending on the climate, season, environmental temperature, humidity and vegetation, favourable for the biology of different insect and tick species
- Experimental demonstration of the vector transmission is challenging
- Finding PCR positive vectors indicate that they have been feeding on infected animal



Transmission by blood-feeding insects

- *Aedes aegypti* mosquito (Chihota *et al* 2001)
- Stable fly (*Stomoxys calcitrans*) is a commonly suspected vector - transmission of SPPV demonstrated by Kitching *et al* 1986
- Mechanical mode of transmission is likely to occur by also by other biting, blood-feeding insects that feed and change hosts frequently
- The role of other local insect species needs to be investigated
- The **big** question is: Does the virus multiply in insects?



Transmission of LSDV by hard (ixodid) ticks

- Mechanical transmission has been demonstrated in common sub-Saharan ticks: *Rhipicephalus (Boophilus) decoloratus*, *Rhipicephalus appendiculatus* and *Amblyomma hebraeum*
- Closely related species in the Middle East region: *R. (Boophilus) annulatus*, *R. praetextatus*, *A. variegatum* and *Hyalomma extravatum*
- No research carried out on European tick species



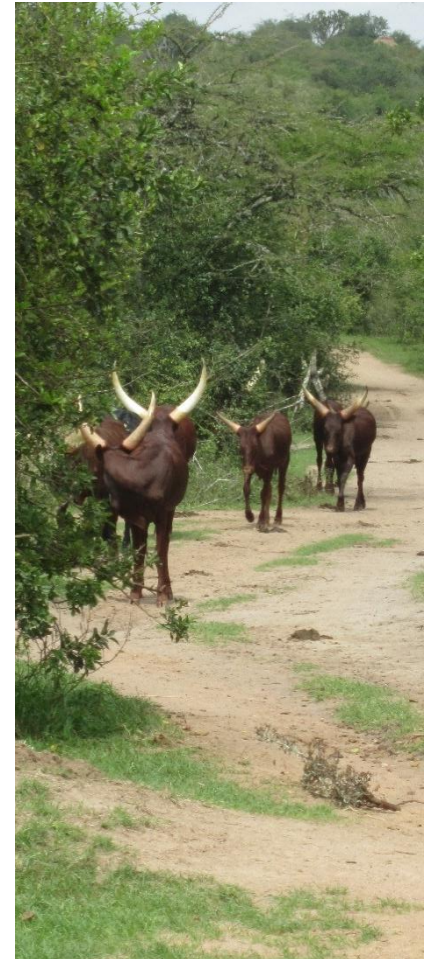
Role of birds and air currents in long-distance spread

- Contaminated flying insects may be carried short distances by air currents
- Role of birds as carriers of insects and ticks?
- Does biological transmission occur? Does virus multiply in insects and ticks?
- In case of mechanical transmission - How long the virus remains infective in the mouth parts of the vector



Identified risk factors

- High risks are involved in animal movements from affected to disease-free regions (even from vaccinated herds)
- Index case is usually associated with introduction of infected animal(s) with or without clinical signs to a naïve herd or in close proximity such as slaughterhouses, cattle market places, cattle collection and resting stations
- Asymptomatic viraemic animals may transmit the virus from healthy looking skin via mechanical vectors
- Presence of animals with silent infections complicates disease control if/when slaughter of all infected and in-contact animals is not feasible



Identified risk factors

- Abundance of blood-feeding vectors - responsible for local dissemination of the virus
- Presence of suitable breeding sites for insects
- Slaughterhouses and temporary slaughter plants, cattle market places, cattle collection and resting stations
- Uncontrolled transboundary animal movements
- Nomadic and transhumance farming practises
- Accumulation of sufficient numbers of naïve animals



Regional elimination of LSD

- Enforced efforts to set up trans-regional elimination programme is urgently needed
- Strong commitment by the local governments
- Enforced collaboration between countries
- Assistance by the international organizations
- Availability of sufficient funding
- Need for revision the international trade restrictions for those cattle products that are intended only for human use and which do not pose a real threat of spreading the disease
- Need for revision of total-stamping out policy if it prevents farmers to report LSD cases



Thank you for your attention!

Dr Eeva S.M. Tuppurainen, *DVM, MSc, PhD, MRCVS*
*Veterinary Expertise for Controlling Lumpy skin disease, Sheeppox and
Goatpox*

Tel. +44 79 63828625
tuppurainene@gmail.com



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