



Lumpy skin disease overview

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Economic impact of LSD for small-holders



- In many countries within affected regions, the majority of cattle holdings have < 10 cattle
- In some cases, farmers owning 5 – 10 cattle are considered as commercial farmers
- Local (or mixed) cattle breeds produce an average of 10 litres of milk /day – partly for own use, for a calf and to prepare cheese/yogurt other products for extra income and when cash is needed calves are sold
- Small-holders and backyard farmers (<two cattle) are being hit worst by an outbreak
- Total production of severely infected animal is lost
 - Affected cow doesn't give milk, may/or may not abort, getting thinner and thinner and eventually the skin is full of scars - recovery not good and takes several months
- Compensation may be obtained but it's difficult to find a new animals



LSD in an intensive cattle production unit



- European high-producing dairy cows in the peak of production are the most susceptible
- Due to the insect transmission, there is no way to effectively protect these holdings although using insect repellents in the facilities and spot-on products
- Massive financial losses in intensive milk or beef cattle production units and cattle collections stations
- Partial stamping-out in a farm with 3000 animals – 1000 with severe clinical disease
- A considerable environmental problem with the disposal of large numbers of infected carcasses
- Vaccination well in advance is the only feasible way to protect these farms - should vaccination of these farms be a priority?

Evaluating the age of the skin lesions

7 dpi



1 to 2 weeks



2 weeks



2 to 3 weeks



3 weeks



Evaluating the age of the skin lesions

3 weeks



3 to 4 weeks



5 weeks



Eye lesion





Epidemiology and transmission in a nutshell

- Morbidity rate varies between 5 to 45% and mortality rate usually remains below 10% (low figures are likely due to total stamping-out)
- Introduction of the first case is usually associated with cattle movements from affected regions
- No carriers but silent infections occur
- Mainly transmitted mechanically by biting insect and tick vectors
- Difference between mechanical and biological transmissions
- To date there is no evidence on viral replication in vectors (biological) – major difference with bluetongue



Modes of transmission

- Insects and ticks
- Shared drinking troughs or feeding sites
- Iatrogenic mode by veterinary treatments and vaccinations
- Is direct contact as ineffective as claimed??? More research needed
- From mothers to calves - trans-placental transmission and sucking calves may get infected via milk or from skin lesions in the teats
- From males to females - Seminal transmission via natural mating or artificial insemination





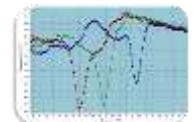
Safety of commodities

- LSD is not zoonotic
- No reports on the transmission of LSDV via meat products, hides and skins – the link between an infected product and susceptible animal is unlikely (different from ASF)
- Presence of the virus is in milk – Bulgarian milk studies waiting to be published
- Human consumption is not a problem - Milk from severely affected animals is not likely to end up for consumption and milk is pasteurized
- More importantly: What to do with the milk from the rest of the animals in the herd
- Heat treatment of milk and meat products – 2 hours at 56° Celsius degrees or 30 minutes at 64° inactivates the virus
- Pasteurization process differs
- Calves - colostrum/milk from infected cows is a risk - feasibility must be considered case by case basis if the cow and the calf are at the same holding with abundance of vectors



Diagnostic tools are available for...

- For the **basic detection**: Several gel-based and real-time PCR methods for the detection of capripoxvirus group
- If **clinical signs are detected in cattle vaccinated with homologue LSDV vaccine**
 - Molecular assays to differentiate between attenuated vaccine and virulent field strains
 - Israeli and Greek reference laboratories
 - Sequencing of the GPCR and RPO30 -genes
- If **clinical signs are detected in cattle vaccinated with attenuated SPP or GTP vaccine** or in wild ruminants in regions where LSD SPP and GTP overlap
 - Species-specific molecular methods to differentiate between LSD, SPP and GTP viruses
 - International Atomic Energy Agency, Vienna





Challenges for effective control and surveillance of LSD

- Vector transmission
- Unauthorized transboundary trade of cattle occurs
- Nomadic and seasonal movements of cattle is difficult/impossible to halt
- Villages with high density of cattle holdings and use of communal pastures create large epidemiological units – direct effect on the feasibility/affordability of stamping-out policies
- Substantial logistic problems when disease control and surveillance measures are carried out in isolated small-holdings in remote locations (particularly in the mountainous regions)
- In some cases VS are lacking vehicles or other means of transport or petrol
- Disposal of culled animals - availability of suitable land, presence of ground water and availability of excavators, small capacity of mobile incinerators



Cattle ID, vaccination, movement and LIMS database

- Database should be on the top of the priority list for government funding and for international projects carried out in the region
- Affected countries have databases in place, varying from excellent to very basic
- Often databases for ID and movement, vaccination records and LIMS are separate – Ideally combined to one
- **User-friendly system – the district veterinarians, particularly the older generation need training**
- **A designated administrator is required**
- Other common problems:
 - Who covers the costs of the ear tags and registration?
 - Cattle census not updated and database contains animals that do not exist any more
 - In practice replacement of lost ear tags when vaccinated or samples are collected – update of the database

Pregnant cows and calves born from infected mothers

- In general, removal of severely infected animals from the herd is always recommended
- Calves can be infected in the womb as sometimes reported born with skin lesions
- Usually approximately 50% infected animals do not show clinical signs
- How to handle those cases of infected mother which is just about to give birth
- Should the cow be allowed to give birth before culling?
- If not with clinical signs the calf is likely to be born with good immunity against LSD?
- Minimize the economic losses of the cattle-owner



Compensation of animals culled/died from LSD

- Severely infected animals should always be removed from the cattle population
- If only those cattle that have died from LSD are compensated – euthanasia is not used although clearly indicated, leading to prolonged suffering and animal welfare issues
- No compensation policy leads to underreporting
- Compensation with money full or partial market value
 - Farmer is allowed to send the animals for slaughter - Compensation covers the difference between market value of live animal and value of meat
- Compensation with a vaccinated pregnant animal – allows improvement of the gene pool of the cattle population
- Compensation with sheep/goats?
- A trade opportunity for countries where preventive vaccination against LSD is used



Thank you! Any questions?

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