



Vaccination against LSD and BT

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Vaccines against LSDV

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- Only live vaccines currently available against LSDV – none of them authorised for use within the European Union
- No DIVA vaccines available (Differentiating Infected from Vaccinated Animals)
- Superiority of live attenuated vaccines compared to the killed ones
- A replicating poxvirus generates better immunity than inactivated vaccines

Choosing a vaccine against LSD

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- Only vaccines with demonstrated efficacy should be used – vaccine challenge experiment at CODA CERVA
- Live attenuated LSDV containing vaccine provides best protection
- Protection provided by attenuated SPPV vaccines is not as good for LSDV but can be used if sufficient herd immunity is created (all animals are vaccinated)
- Other appropriate control measures such as movement restrictions are in place

LSD vaccines on the market

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- **LSDV containing vaccines:**
 - LSDV Neethling strain by Onderstepoort Biological Products (OBP)
 - Attenuated LSDV field strain Lumpyvax by MSD Animal Health
 - Bovivax
- **Sheeppox virus (SPPV) vaccines against LSDV:**
 - Yugoslavian RM65 SPPV vaccine (at a 10 times stronger dose than used for sheep) is commonly used for cattle in the Middle East
 - Romanian SPPV vaccine for cattle in Egypt
 - Bakirköy SPPV (3 times sheep dose) used in cattle in Turkey
- **Gorgan goatpox vaccine**
 - (Lumpysield, Jovac, Jordan) has been demonstrated to provide good protection against LSDV
- **Confusing exception: Kenyan SGPV O-240 and 180 strains are used for cattle in some African countries - despite the name these strains are LSDV**



Vaccination regime and adverse reactions

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- Regional vaccinations preferred over ring-vaccination (radius > 50 km diameter)
- Annual vaccinations with >80% vaccination coverage (all animals)
- All animals are vaccinated including pregnant females and young calves
- Local reaction at the vaccination site should be accepted
- Attenuated LSDV vaccines cause a general reaction in a minority of vaccinated animals (Neethling disease)
- Attenuated SPPV and GTPV vaccines only rarely cause adverse reactions



Adverse reactions

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Vaccines against BTV

Modified live vaccines (MLV)

- Have been used in Europe until 2006 (mono-, bi-, tri- and polyvalent)
- Currently not authorised for use in EU
- Advantages: cheap to produce in large quantities, generate strong antibody response, generate protective immunity after a single dose
- Disadvantages: potential for spread by vectors, reversion to virulence and/or reassortment with wild-type virus strains, adverse side effects in sheep (abortion/embryonic death and teratogenic defects in offspring, fever, facial oedema, lameness and reduced milk production)

Vaccines against BTV

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Inactivated whole virus vaccines

- Approved for use in EU (mono- or bivalent)
- Advantages: safe, no clinical symptoms or adverse effect in vaccinated animals, DIVA is theoretically possible
- Disadvantages: high cost, 2 doses are acquired to induce protective immunity in cattle and in sheep (depending on the manufacturer), need for annual booster immunization

Vaccines against BTV

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Recombinant vaccines

- Under development: canarypox virus-VP2/VP5
- Advantages: safe, highly protective, DIVA is possible (existing VP7 competitive ELISA would distinguish vaccinated from naturally infected animals)
- Disadvantages:???????

Disabled Infectious Single Animal (DISA) vaccine- under development

- Advantage: safe, completely avirulent, rapidly induced immune response
- Disadvantage: need for development of new diagnostic assay as DIVA test, cost????

Technical specification for LSDV and BTV vaccines

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BTV

- to be registered and licensed in the country in accordance with Regulation (EO) № 726/2004 or national legislation;
- **to be inactivated;**
- to be against the serotype/serotypes circulating in the region;
- to provide immunity one year after application of the vaccine;
- the expiry date of the batch to be at least 12 months since the production date;
- to be applicable for bovines and sheep;
- The leaflet for use to have text in the language of the country where vaccination is to be applied



LSDV

- **to have live, attenuated, homologous strain of LSDV**
- to provide immunity against LSD;
- to be sterile, safe and effective
- to be applicable for bovines of all ages the expiry date of the batch to be at least 12 months since the production date;
- to be produced in accordance with the OIE Diagnostic manual
- the leaflet for use to have text in the language of the country where vaccination is to be applied

The best is to vaccinate before the start of the vector activity

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Vaccination against LSDV



Day 0

Movement ban

Day 28

- In non previously vaccinated herds - Vaccination of bovines of all ages
- Vaccination of calves over 4 months of age from previously vaccinated mothers
- Annual vaccination (at least three years)

Vaccination against BTV



Day 30

Day 0
(if no vaccination against LSD)

- Vaccination of bovines over 3 months of age
- Revaccination- in accordance with the instruction from the manufacturer

- Vaccination of sheep over 3 months of age



Subcutaneous application of the vaccine in accordance with the instructions from the manufacturer

Storage of vaccine

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- The vaccine must be stored at 2°C - 8°C.
- Temperature must be recorded with calibrated thermometer twice a day (once in the morning and once in the afternoon)
- Once the bottle is opened the vaccine must be used the same day.



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Thank you for the attention!