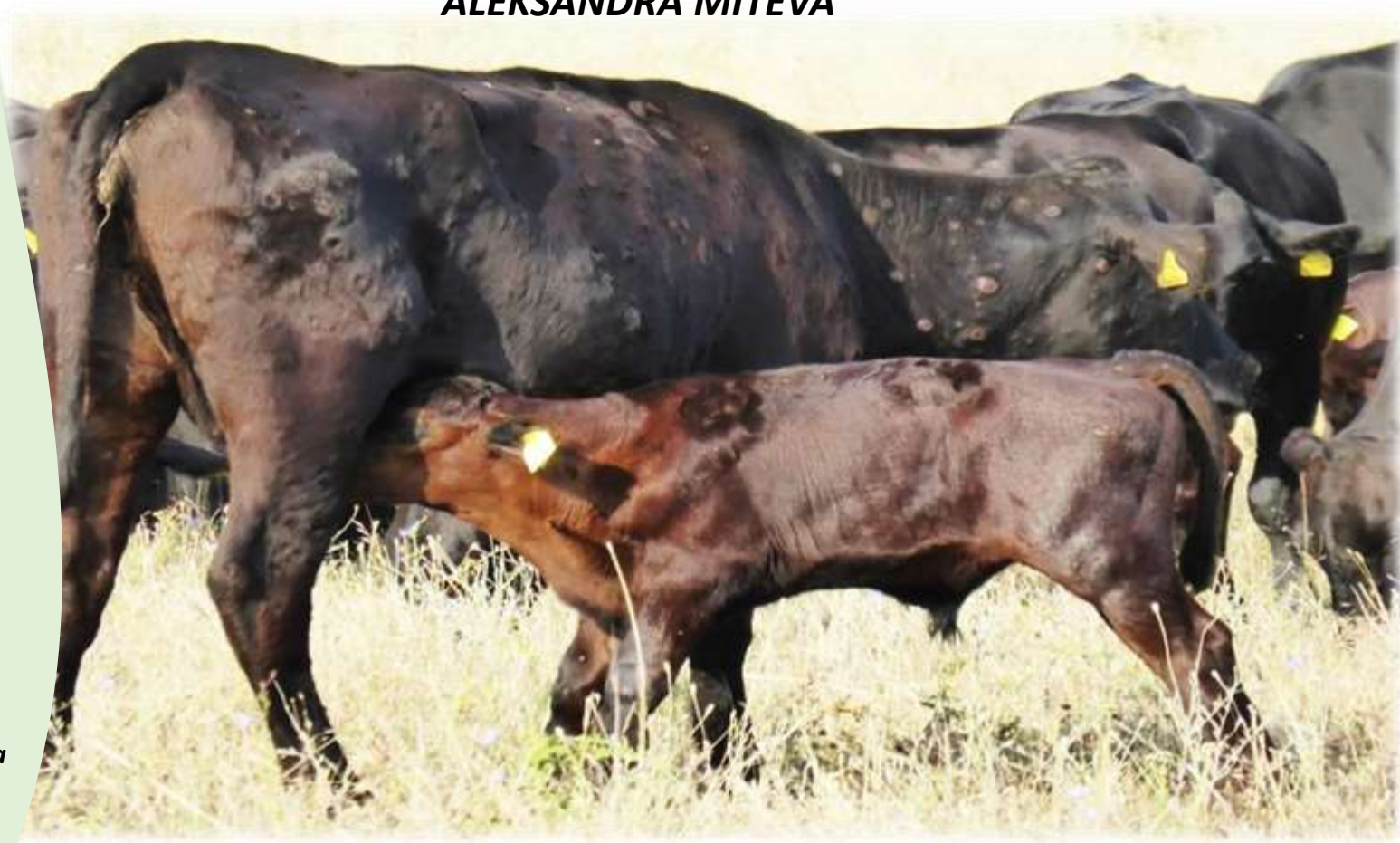


# EMERGENCY VACCINATION LUMPY SKIN DISEASE

*ALEKSANDRA MITEVA*

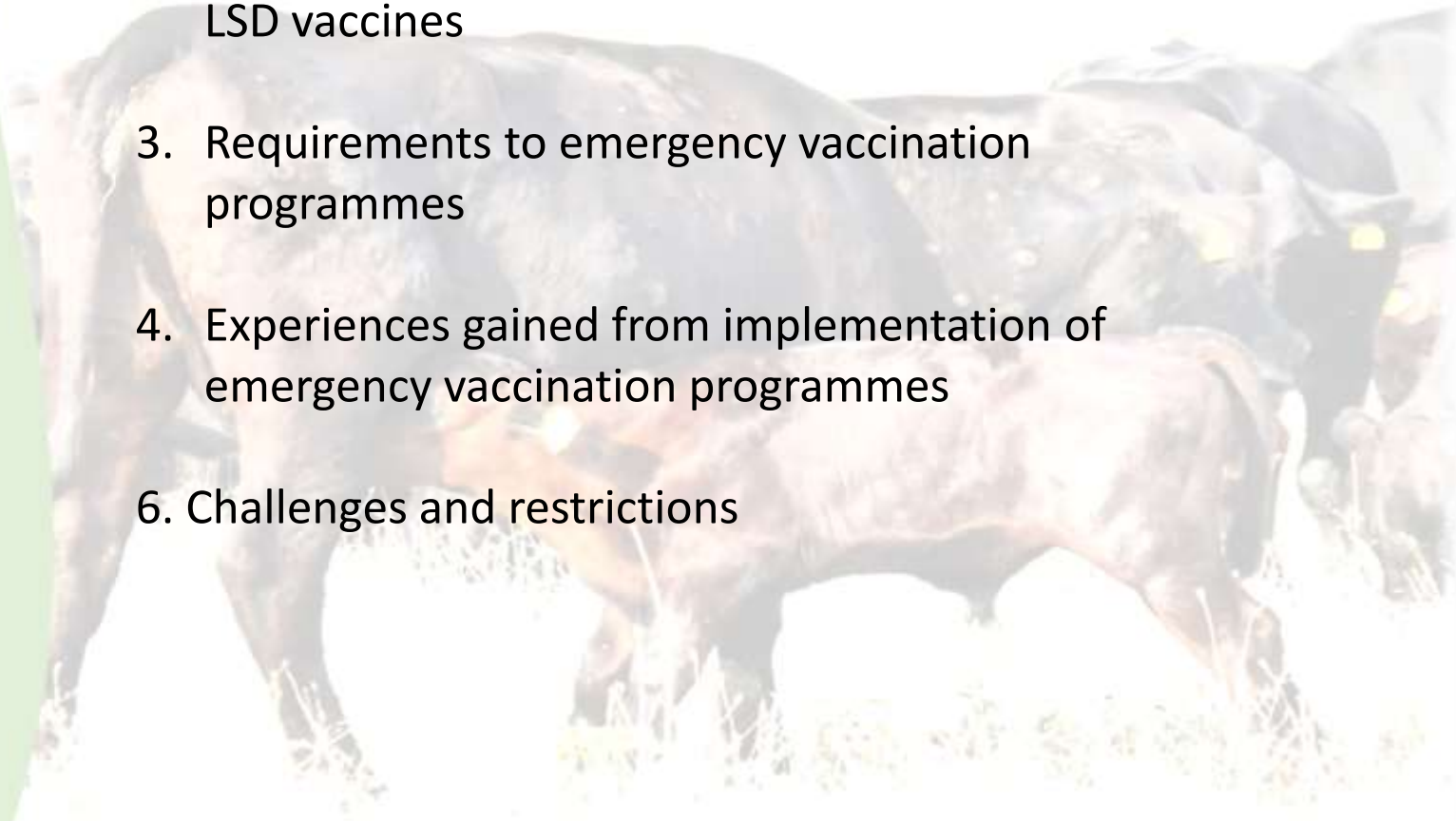


*NBVCG seminar*

*3 – 4/10/2018, Riga, Latvia*

# Content

1. Introduction for LSD
2. Control measures - emergency vaccination and LSD vaccines
3. Requirements to emergency vaccination programmes
4. Experiences gained from implementation of emergency vaccination programmes
6. Challenges and restrictions

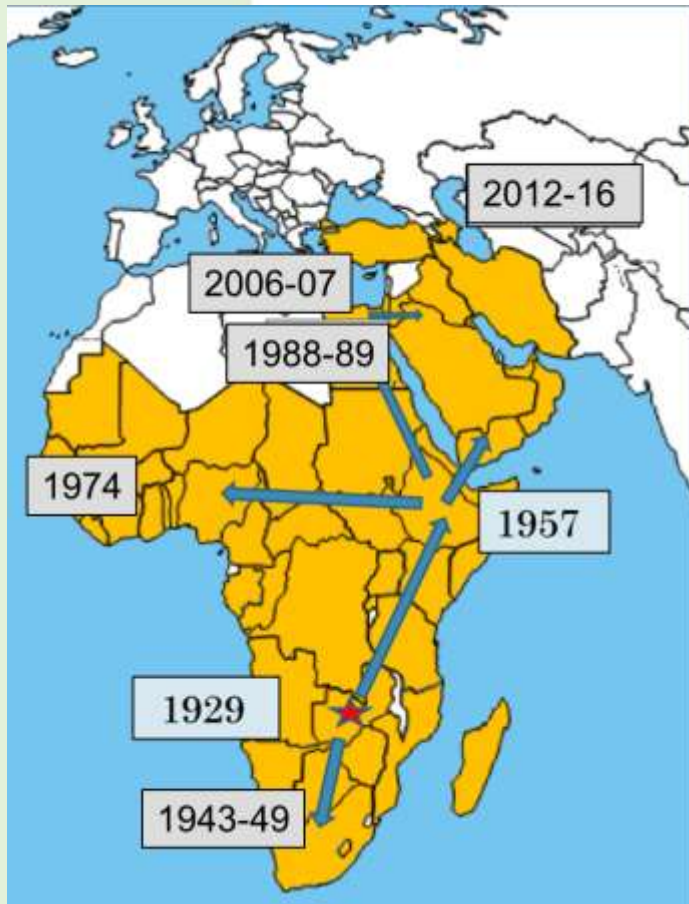


# Introduction

- ✓ Capripoxvirus-genus within the Poxviridae-family), other members of the genus are Sheeppox virus and Goatpox virus
- ✓
- ✓ Characterized by fever, nodules on the skin, and it may lead to severe production losses;
- ✓ Vector-borne LSD;
- ✓ Difficult to eradicate without vaccination
- ✓ Stable virus, survives well in the environment such as wintertime and drought
- ✓ Most disinfectants are effective but disinfection of the environment is difficult as the virus remains well protected inside scabs shed by infected animals ;
- ✓ Substantial economic impact – direct and indirect cost



# Geographical spread

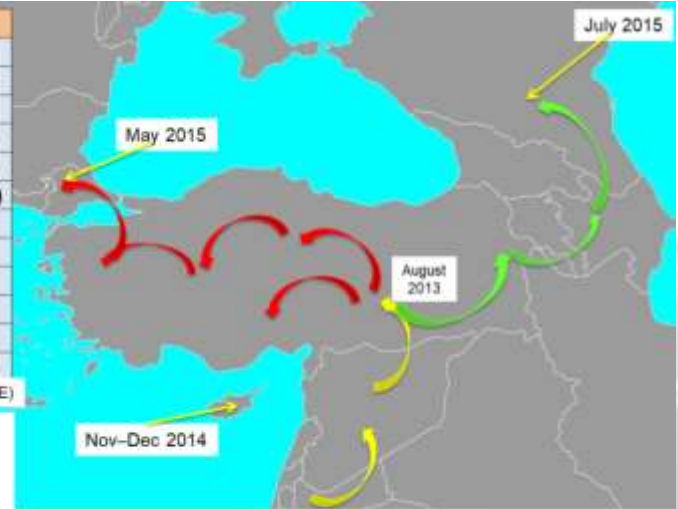


Country	Period
Israel	2012 (July)
Lebanon	2012 (Nov)
Jordan	2013 (April)
Irak	2013 (August)
Turkey	2013 (August)
Egypt	2013 (Decem)
Iran	2014 (May)
Azerbaijan	2014 (July)
Cyprus	2014 (Nov)
Kuwait	2014 (Nov)
Russia	2015 (July)
Greece	2015 (August)

Table from Dr Alessandro Rippani (OIE)

Lumpy Skin Disease epidemiological situation in recent years (Global)

Source : EFSA Journal 2015;13(1):3986, EFSA opinion on LSD, OIE 2015



## LSD epidemiological situation January - Dec 2015 (ADNS + country reports)

LSD outbreaks in SE Europe  
*(Jan – Dec 2015)*

➤ Greece : 117  
*(Aug-Dec 2015)*

● LSD outbreaks  
01.01-31.12.2016 (ADNS)



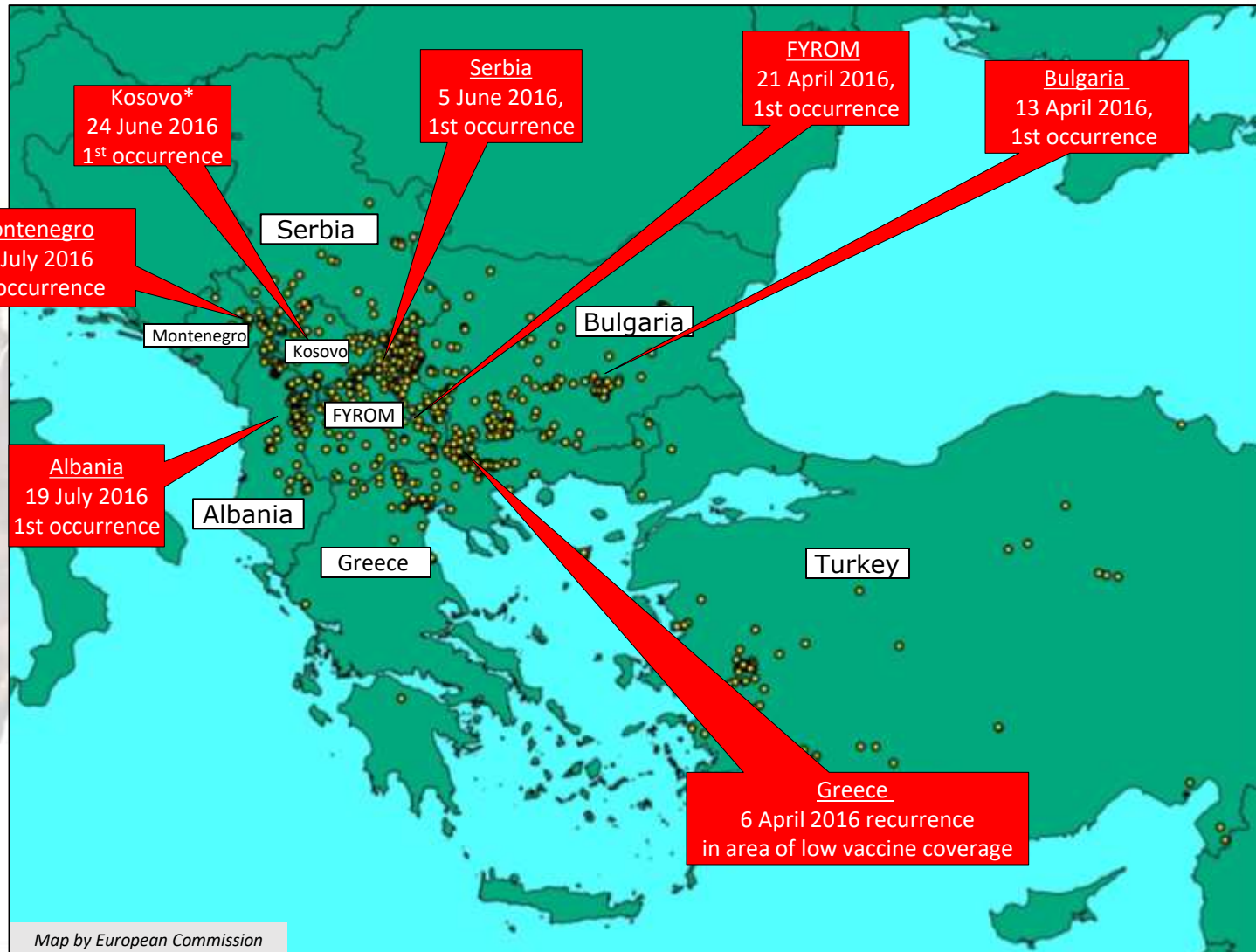
## LSD epidemiological situation January - Dec 2016 (ADNS + country reports)

### LSD outbreaks in SE Europe (Jan – Dec 2016)

- Greece : 104 (ADNS)  
(last on Nov 2016)
- Bulgaria : 217 (ADNS)  
(last on Aug 2016)
- FYROM : 1.591 (Sep. report)
- Serbia: 225 (ADNS)  
(last on Oct 2016)
- Kosovo\*: 1.415 (EFSA report)
- Montenegro: 436 (EFSA rep.)
- Albania: 3.647 (EFSA report)

(\* This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence).

● LSD outbreaks  
01.01-30.11.2016 (ADNS)



## LSD epidemiological situation January - 30 Sep 2017 (ADNS + country reports)



### LSD outbreaks in SE Europe (Jan – Sep 2017)

Jan – February 2017

➤ Albania: 494  
(ADNS, 160 with a suspected date in 2017)

April 2017  
recurrence

➤ Greece : 2 (ADNS)

March  
2017

➤ FYROM : 4 (ADNS)

Aug  
2017

● LSD outbreaks  
01.01-30.09.2017( ADNS)

# LSD control strategies

- ✓ Stamping-out policy (total or partial) of the affected herds;
- ✓ **VACCINATION** ( only live attenuated vaccines);
- ✓ Movement restrictions;
- ✓ Vector control





# Vaccines against LSDV

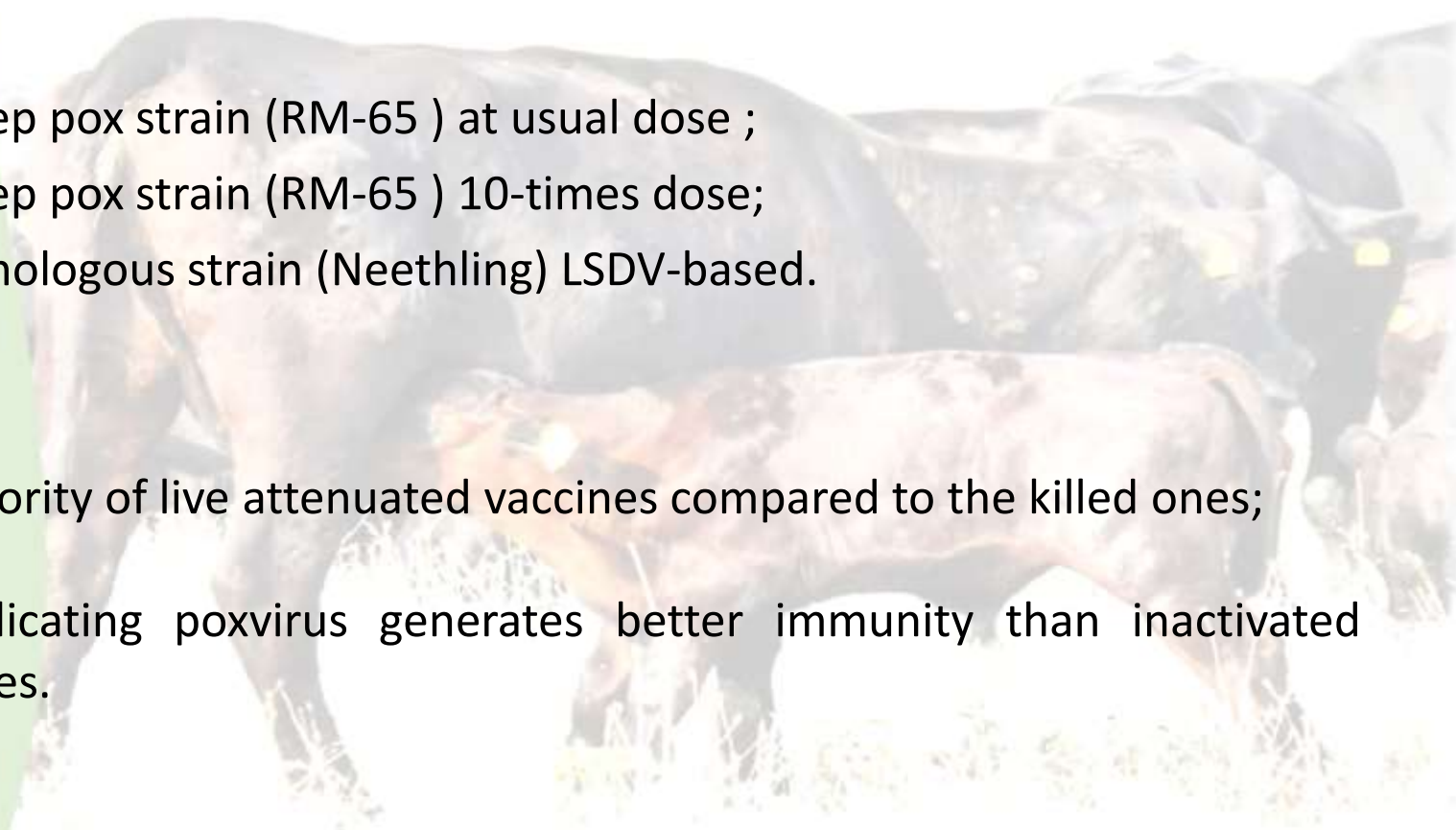
- ✓ **Commercial available** - Only live vaccines currently available against LSDV, no DIVA – none of them authorised for use within the European Union:

sheep pox strain (RM-65 ) at usual dose ;

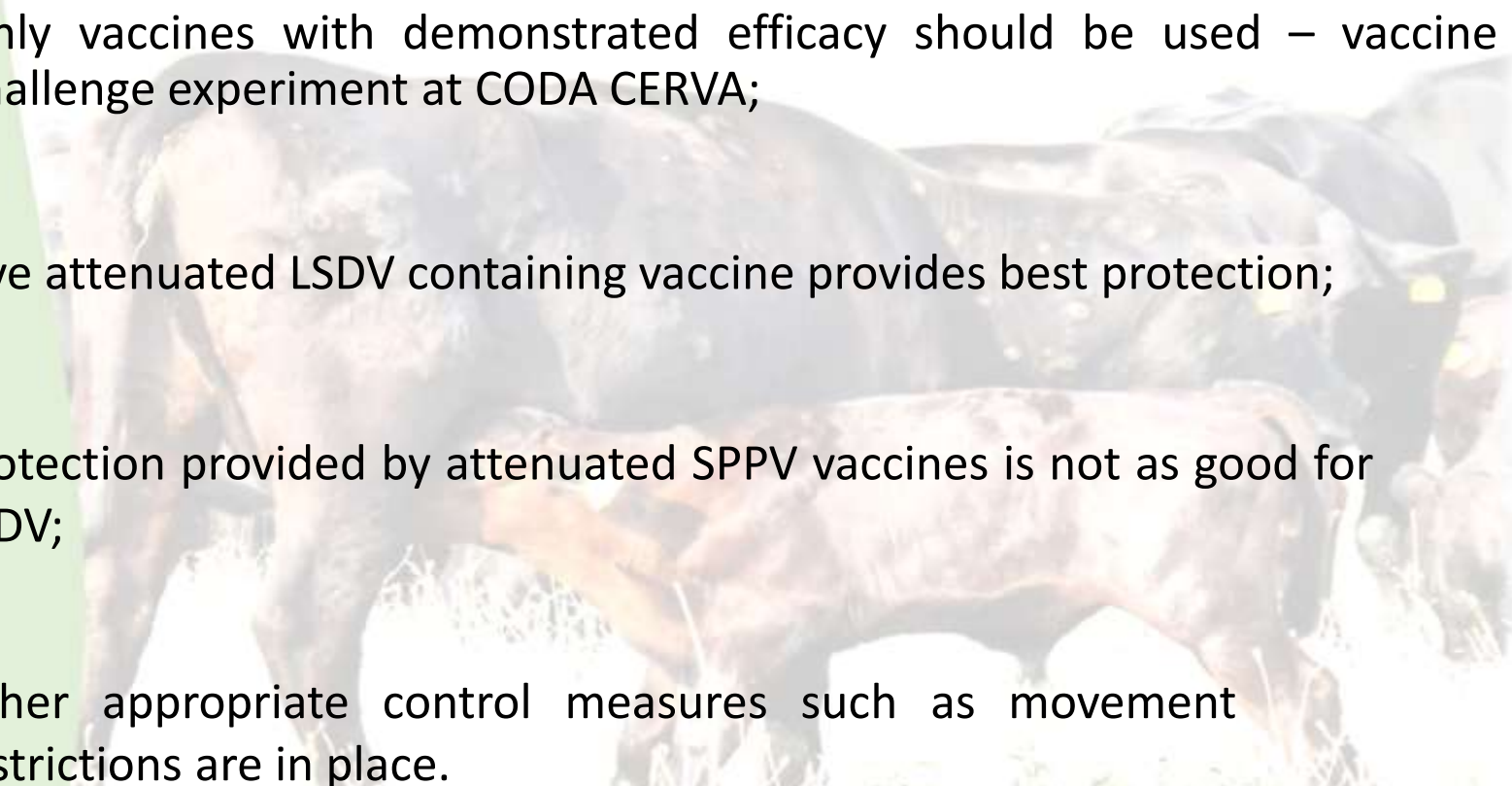
sheep pox strain (RM-65 ) 10-times dose;

Homologous strain (Neethling) LSDV-based.

- ✓ Superiority of live attenuated vaccines compared to the killed ones;
- ✓ A replicating poxvirus generates better immunity than inactivated vaccines.



# Choosing a vaccine against LSD

- ✓ 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;
  - ✓ Other appropriate control measures such as movement restrictions are in place.
- 

# LSDV vaccines on the market

## LSDV vaccines:

- LSDV Neethling strain by Onderstepoort Biological Products (OBP)
- Attenuated LSDV field strain Lumpyvax by MSD Animal Health (South-Africa)
- Bovivax (MCI, Morocco + Huvepharma, Hungary)



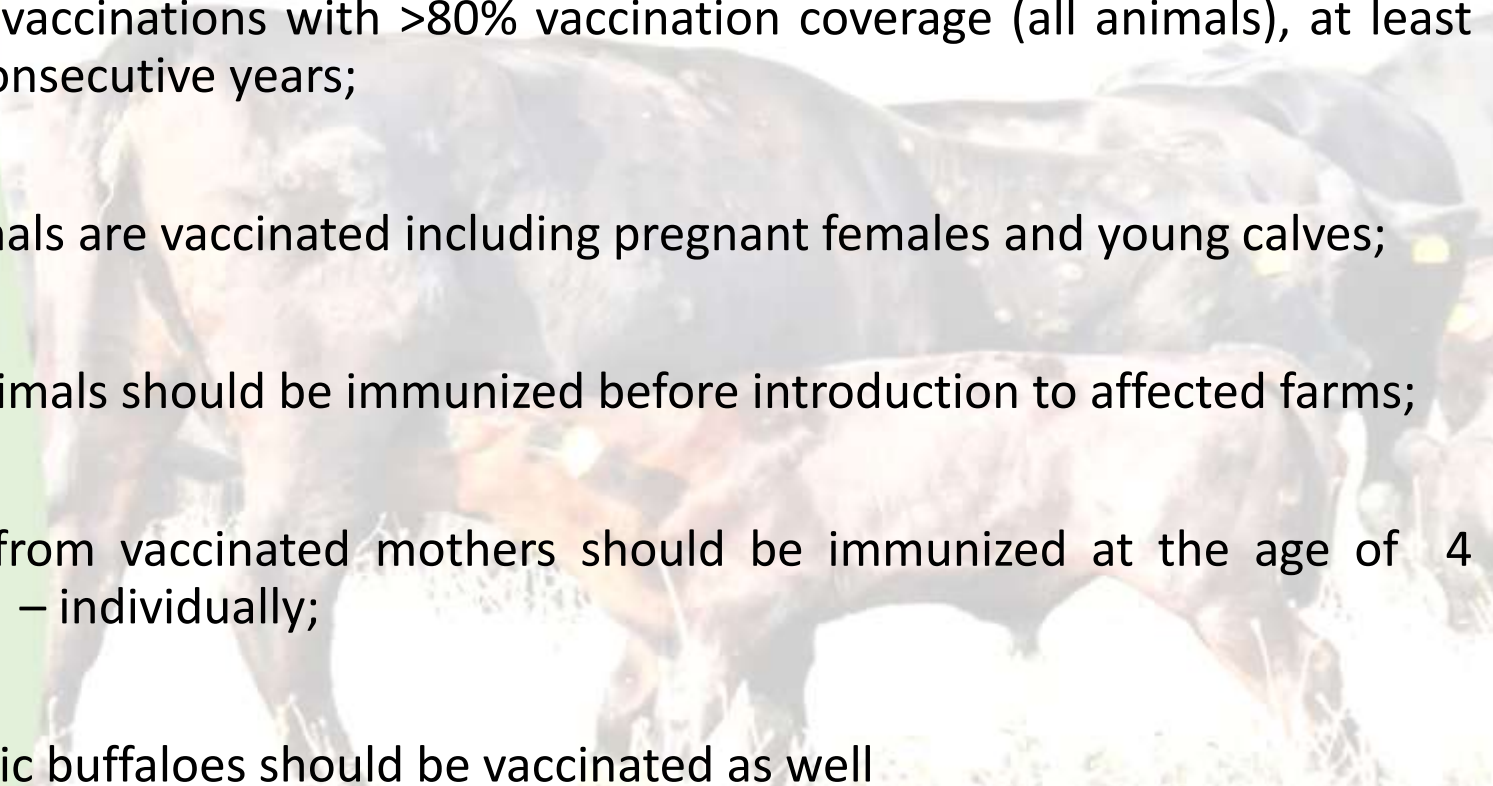
## Sheeppox virus (SPPV) vaccines against LSDV:

- 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 (Lumpyshield, Jovac, Jordan)

Confusing exception: Kenyan SGPV O-240 and 180 strains are used for cattle in some African countries - despite the name these strains are LSDV

# Requirements for vaccination programme

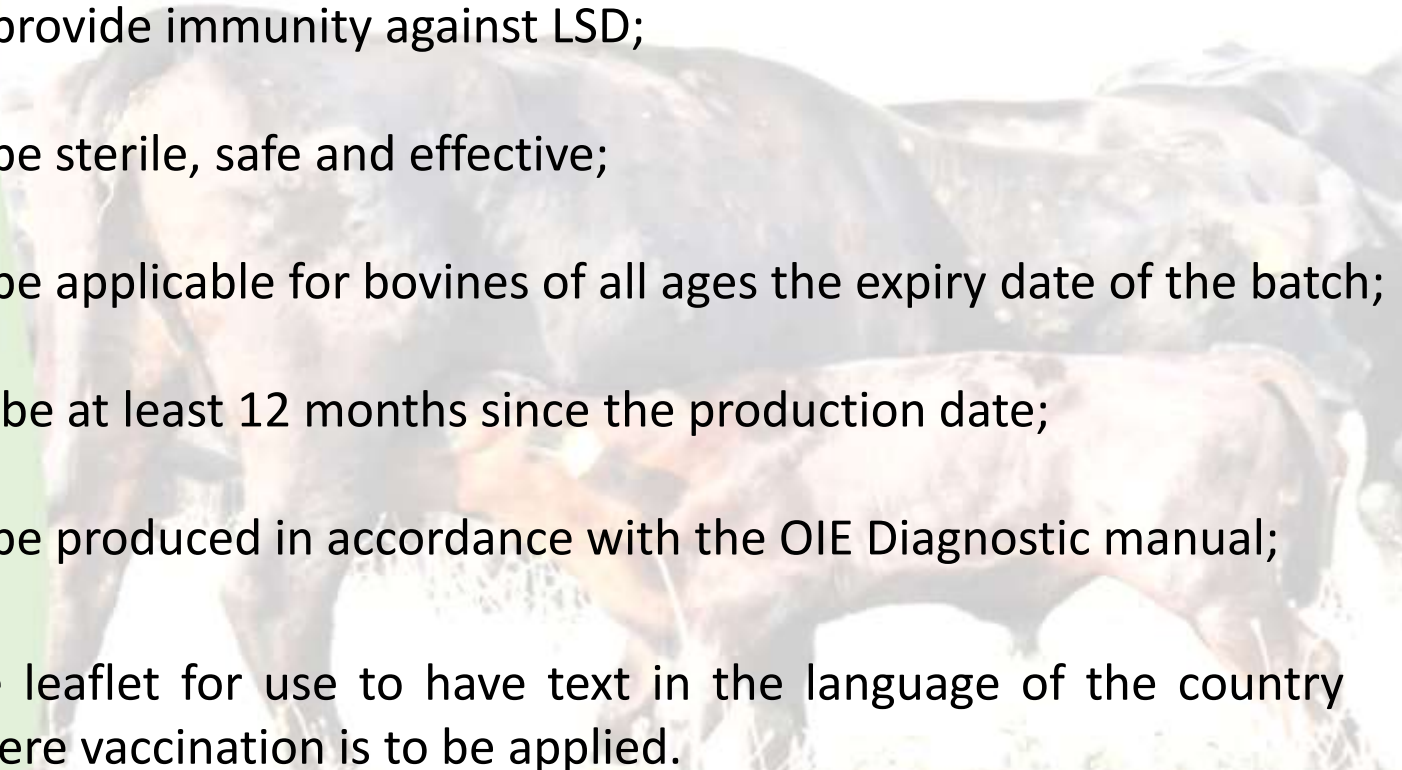
- ✓ Regional vaccinations preferred over ring-vaccination (radius > 50 km diameter);
  - ✓ Annual vaccinations with >80% vaccination coverage (all animals), at least three consecutive years;
  - ✓ All animals are vaccinated including pregnant females and young calves;
  - ✓ New animals should be immunized before introduction to affected farms;
  - ✓ Calves from vaccinated mothers should be immunized at the age of 4 months – individually;
  - ✓ Domestic buffaloes should be vaccinated as well
- 
- A group of domestic buffaloes, including several adults and a young calf, are shown in a field. The buffaloes are dark brown or black with some lighter patches. They are standing and grazing on grass. The background is a bright, slightly hazy outdoor setting.

## Adverse reactions



- ✓ Attenuated LSDV vaccines may cause a general reaction in a minority of vaccinated animals (Neethling disease).

## Technical specification for LSD Vaccine

- ✓ 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.
- 

# Vaccination against LSDV

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



Day 0

Movement ban

Day 28

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

- ✓ In non previously vaccinated herds - Vaccination of bovines of all ages
- ✓ Vaccination of calves from previously vaccinated mothers 3 - 4 months of age
- ✓ Annual vaccination (at least three years)

# Storage of vaccine

- ✓ 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;





# LSD measures (*Dir. 92/119/EEC*)

## Art 19 - Vaccination

Vaccination against the diseases listed in Annex I may not be carried out except as a supplement to control measures taken when the disease in question broke out, in accordance with the following provisions: .....

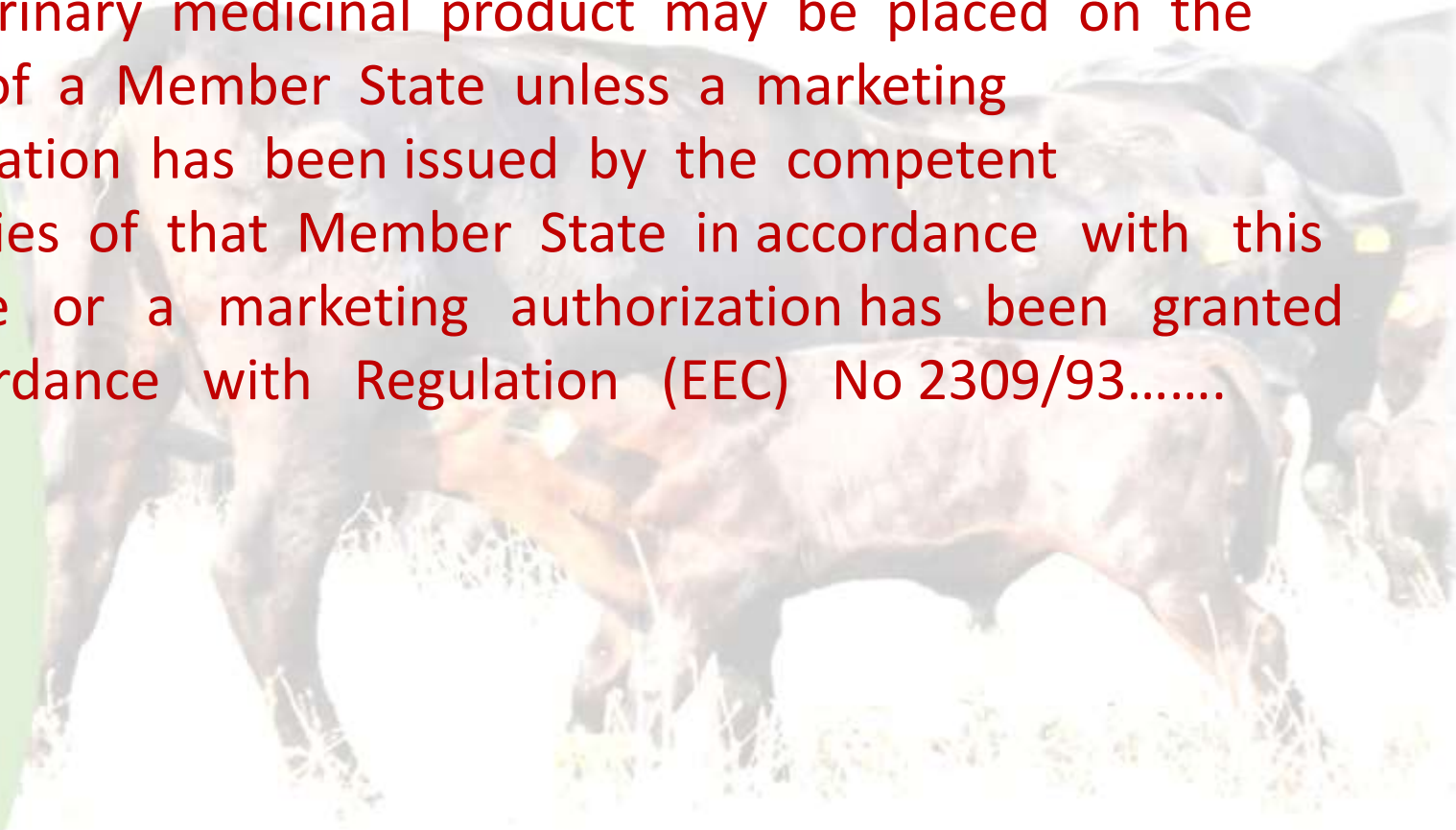
- *the decision to introduce vaccination as a supplement to control measures shall be taken by the Commission, in cooperation with the Member State concerned*

*EU legislation*

- *Council Directive 92/119/EEC*
- *Council Directive 2001/82/EC*

VMP (*Dir. 2001/82/EEC*)  
Art 5 Marketing authorization

No veterinary medicinal product may be placed on the market of a Member State unless a marketing authorization has been issued by the competent authorities of that Member State in accordance with this Directive or a marketing authorization has been granted in accordance with Regulation (EEC) No 2309/93.....



## LSD vaccination in SE Europe 2015-2017

### 2015

- LSD vaccination in the North – *Eastern Provinces of Greece*

### 2016

- All LSD affected countries (*Greece, Bulgaria, the former Yugoslav Republic of Macedonia, Serbia, Kosovo\**, *Albania, Montenegro*) implemented mass vaccination of all their cattle against LSD in their entire territory.
- *Croatia*, not affected by LSD, became the 1<sup>st</sup> country to implement preventive vaccination of its entire country population against LSD (**August** 2016)

### 2017

- All countries in SE Europe that vaccinated against LSD in 2016 repeat vaccination in 2017 (annual revaccination + vaccination of newborn animals);
- *Bosnia and Herzegovina*, not affected by LSD, began implementing preventive vaccination against LSD since 2017 (2<sup>nd</sup> country to implement preventive vaccination after Croatia).

**LSD vaccination in South East Europe in 2015 – Situation as at Dec 2015**

Vaccination in:  
 ➤ Greece (Northern part), not full vaccine coverage every where

■ Vaccination area (not full coverage)  
 ● LSD outbreaks as at 1 Jan -31 Dec 2015 (ADNS)



**LSD vaccination in South East Europe in 2016 – Situation as at early 2017**

Vaccination completed in:  
 ➤ Bulgaria  
 ➤ Greece (Northern part)  
 ➤ Serbia  
 ➤ FYROM  
 ➤ Montenegro  
 ➤ Kosovo  
 ➤ Croatia  
 ➤ Albania

Vaccination in progress in  
 ➤ Southern part of continental Greece

■ Vaccination Completed by end 2016 - early 2017  
 ■ Vaccination in progress  
 ● LSD outbreaks as at 1 Jan -31 Dec 2016 (ADNS)



**LSD vaccination in South East Europe– Situation as at mid- October 2017**

Vaccination completed since 2016 (annual revaccination in progress) or completion of primary vaccination:

➤ Bulgaria  
 ➤ Greece (Northern part)  
 ➤ Serbia  
 ➤ FYROM  
 ➤ Montenegro  
 ➤ Kosovo  
 ➤ Croatia  
 ➤ Albania

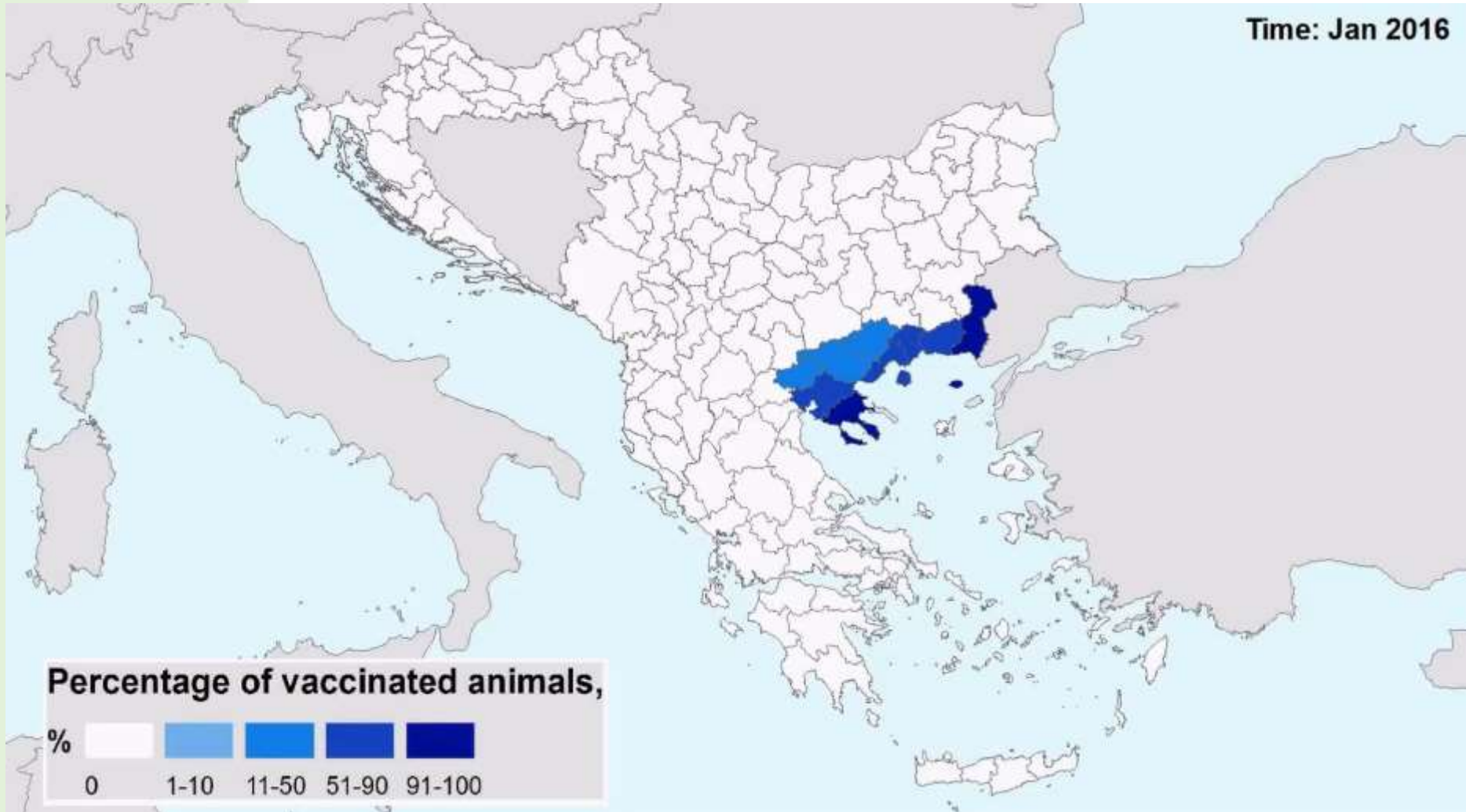
Vaccination in progress in  
 ➤ Southern part of continental Greece & islands  
 ➤ Bosnia & Herzegovina

■ Annual revaccination in progress or completion of primary vaccination  
 ■ Primary vaccination in progress  
 ● LSD outbreaks as at 1 Jan-15 Oct 2017 (ADNS)



- In all cases the vaccines used in the above countries were live, homologous vaccines against LSD imported from outside the EU.
- In most cases occurrence of new LSD outbreaks in affected countries as above stopped within 1 month following proper completion of their vaccination campaign

Time: Jan 2016



**Percentage of vaccinated animals,**

% 0 1-10 11-50 51-90 91-100

Andrey Gogin; Alessandro Broglia; Representatives from veterinary services of Albania, Bulgaria, Croatia, the former Yugoslav Republic of Macedonia, Greece, Kosovo\*, Montenegro, Serbia and Turkey

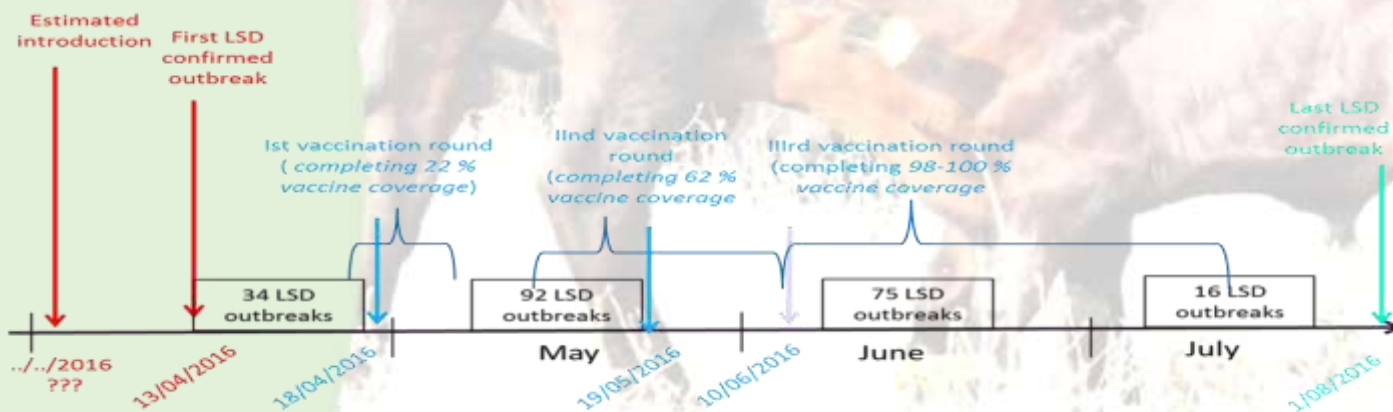
# Emergency vaccination in Bulgaria in 2016



*I st vacc round / 18 Apr – 05 May/ - 150 000 doses OBP / from EU bank (Neetling strain) around the LSD outbreaks at that time;*

*II nd vacc. round: /19 May – 5 June/ - 275 000 doses Intervet (SIS type) used for the rest of South, North-western areas of Bulgaria;*

*III th vacc. round: 10 June – 15 July - 350 000 doses OBP used for the rest of Bulgaria; 100% vaccine coverage*






Two weeks after completion of vaccination no new outbreaks in the vaccination area

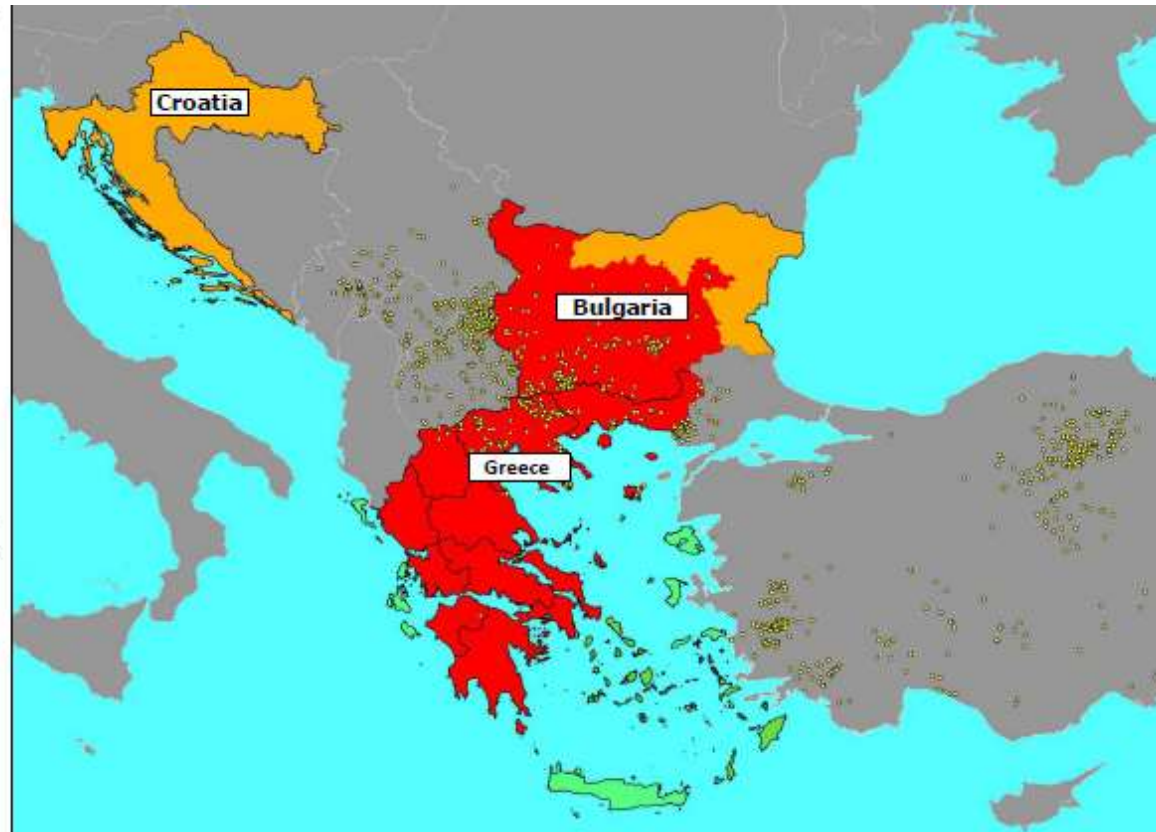
# Restrictions in EU

## LSD zoning (Dec. 2016/2008)

✓ *movement allowed under conditions*

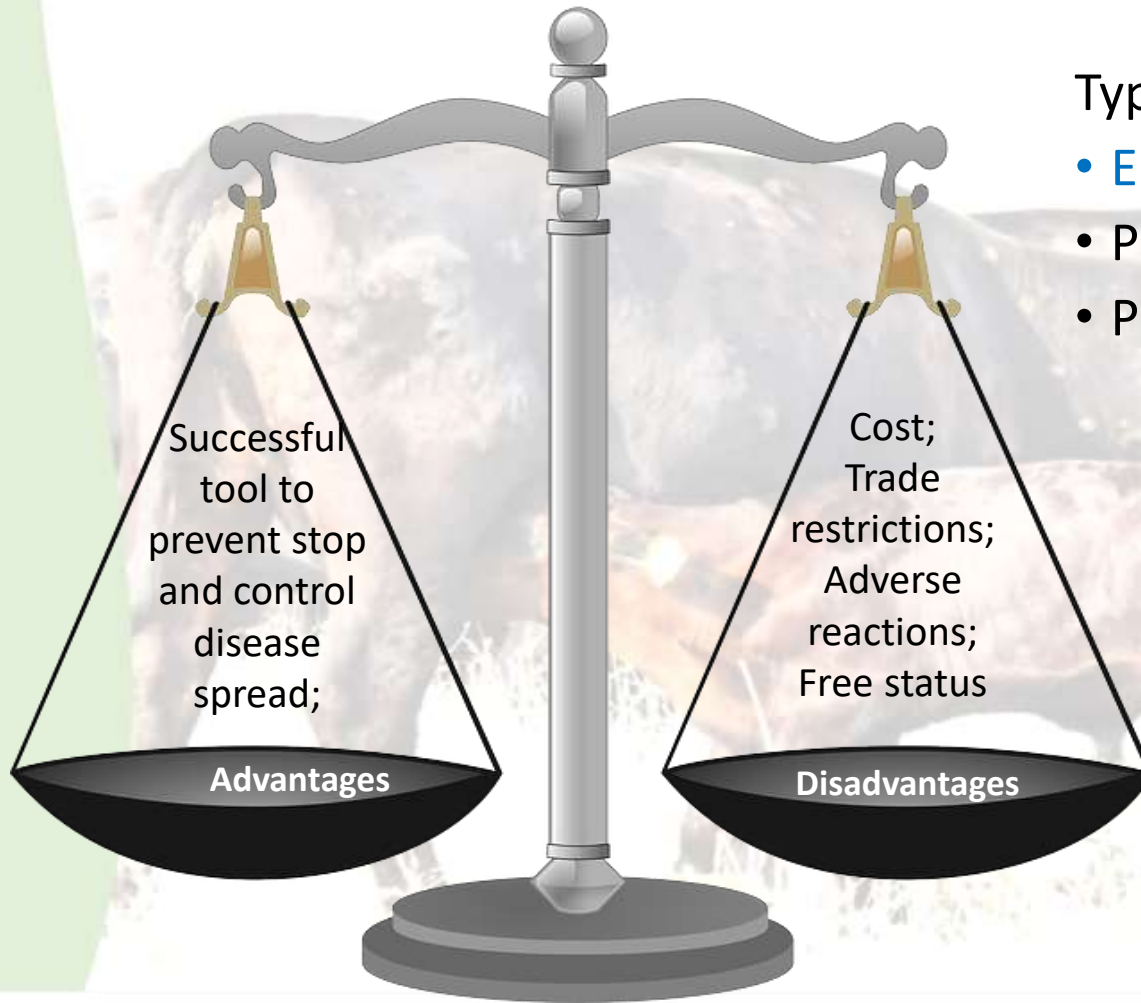
- Free zones with Vaccination (Part I):
- Croatia
  - Bulgaria (certain areas in the North and East part)
- Infected zones (Part II):
- Continental Greece (including the island of Limnos)
  - Bulgaria (excluding the "free with vaccination" zones)

-  Free with Vaccination zone
-  Infected zone
-  LSD outbreaks 2015-Sep 2016 (ADNS)



# Take home messages.....

## Vaccination – a tool for disease control



Types:

- Emergency
- Preventive
- Prophylactic



## Take home messages.....

- ✓ Vaccination is found to be the only effective means to reduce the spread of LSD;
- ✓ No single country eradicate LSD without vaccination
- ✓ Calculation of all direct and indirect costs for all the different control strategies for different scenarios and the consequences;
- ✓ Finalized tender procedure/contract for immediately supply of all vaccine needed or vaccine bank available;
- ✓ Preventive vaccination or emergency vaccination immediately after the first outbreaks



# **THANK YOU FOR YOUR ATTENTION**

**ALEKSANDRA MITEVA**

**Animal Health & Welfare  
Bulgarian Food Safety Agency**