Outcomes of the Joint EFSA-SANTE Workshop (11-12 May 2016) and recent EFSA activities on LSD

Andrea Gervelmeyer
Animal Health and Welfare Team
Animal and Plant Health Unit

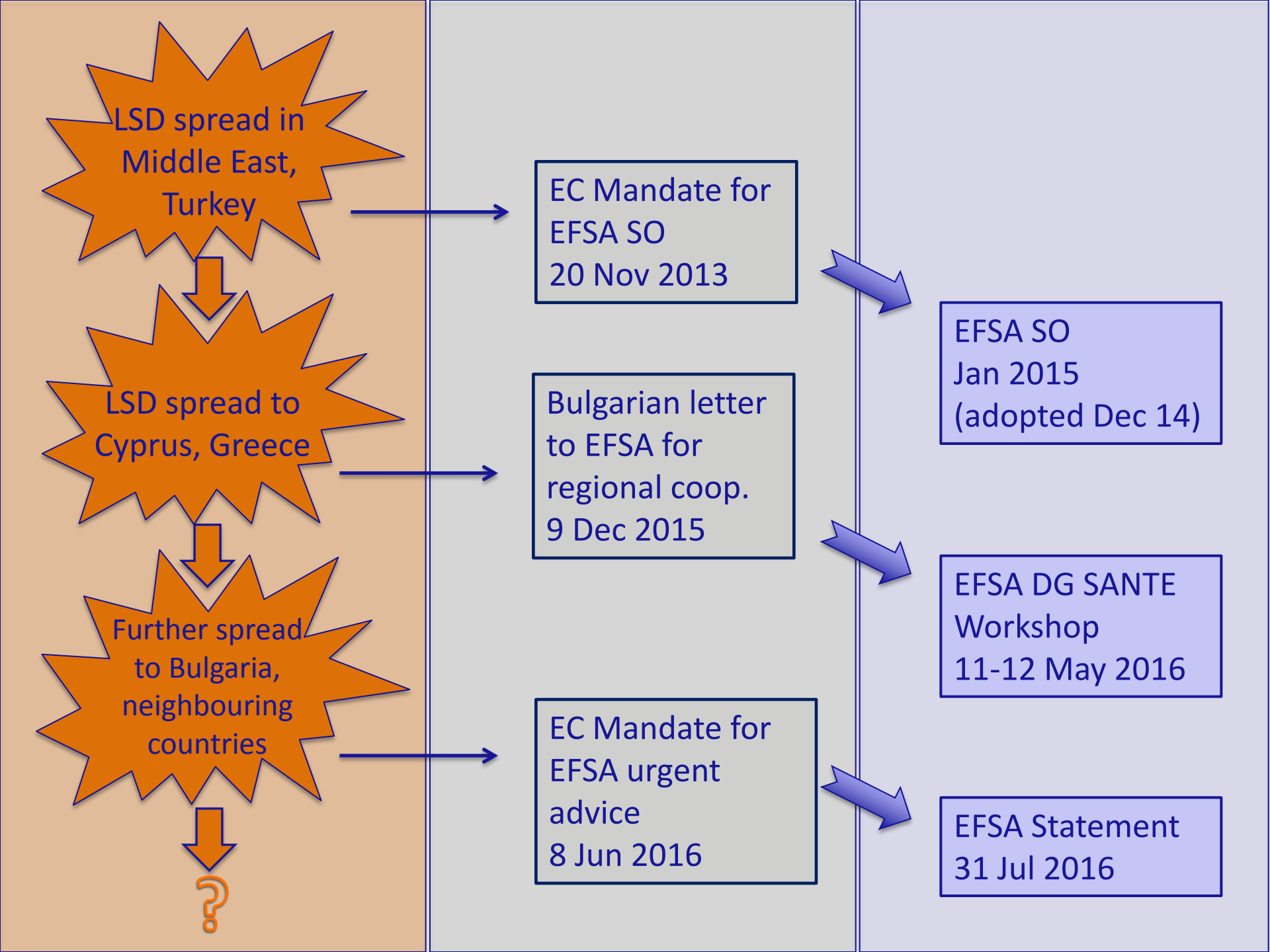
GF-TADs Standing Group of Experts on Lumpy Skin Disease in the South East Europe region - 1st meeting 4-5 Jul 2016

OVERVIEW

I. EFSA scientific opinion on LSD, 2015

II. EFSA/DG SANTE workshop "Strengthening regional cooperation in South East Europe and Middle East for prevention and control of Lumpy Skin Disease (LSD)", 11-12 May 2016

III. EFSA statement on LSD, 31 July 2016


LSD spread in Middle East, Turkey
LSD spread to Cyprus, Greece
Further spread to Bulgaria, neighbouring countries
?
EC Mandate for EFSA SO
20 Nov 2013
Bulgarian letter to EFSA for regional coop.
9 Dec 2015
EC Mandate for EFSA urgent advice
8 Jun 2016
EFSA SO
Jan 2015
(adopted Dec 14)
EFSA DG SANTE Workshop
11-12 May 2016
EFSA Statement
31 Jul 2016

I. EFSA SCIENTIFIC OPINION ON LSD 2015

Background

- spread of LSD throughout the Middle East, including Turkey
- Mandate from DG SANTE 20 Nov 2013

Terms of reference

- Characterisation of the disease
- Assessment of the
  - risk of introduction into the European Union (EU)
  - speed of spread
  - risk of becoming endemic
  - impact of LSD if it were to enter the EU
  - feasibility, availability, effectiveness of main disease prevention & control measures

Selected conclusions

Characterisation of LSD

- endemic in most African countries; since 2012–2013 spreading largely to Middle Eastern countries, including Turkey (endemic)
- ~50 % infected animals develop generalised skin lesions; all infected animals can transmit the virus
- LSDV detectable in animal secretions (e.g. ocular, nasal discharge) up to at least 15 days post infection; protected from sunlight, LSDV survival in scabs, environment, for up to six months; survival in dried hides of infected animals for up to 18 days
- involvement of haematophagus arthropod vectors (flies, ticks) in LSDV transmission (mechanical)
- spread with very low abundances of vectors may occur, thus direct and/or indirect transmission (fomites) may occur

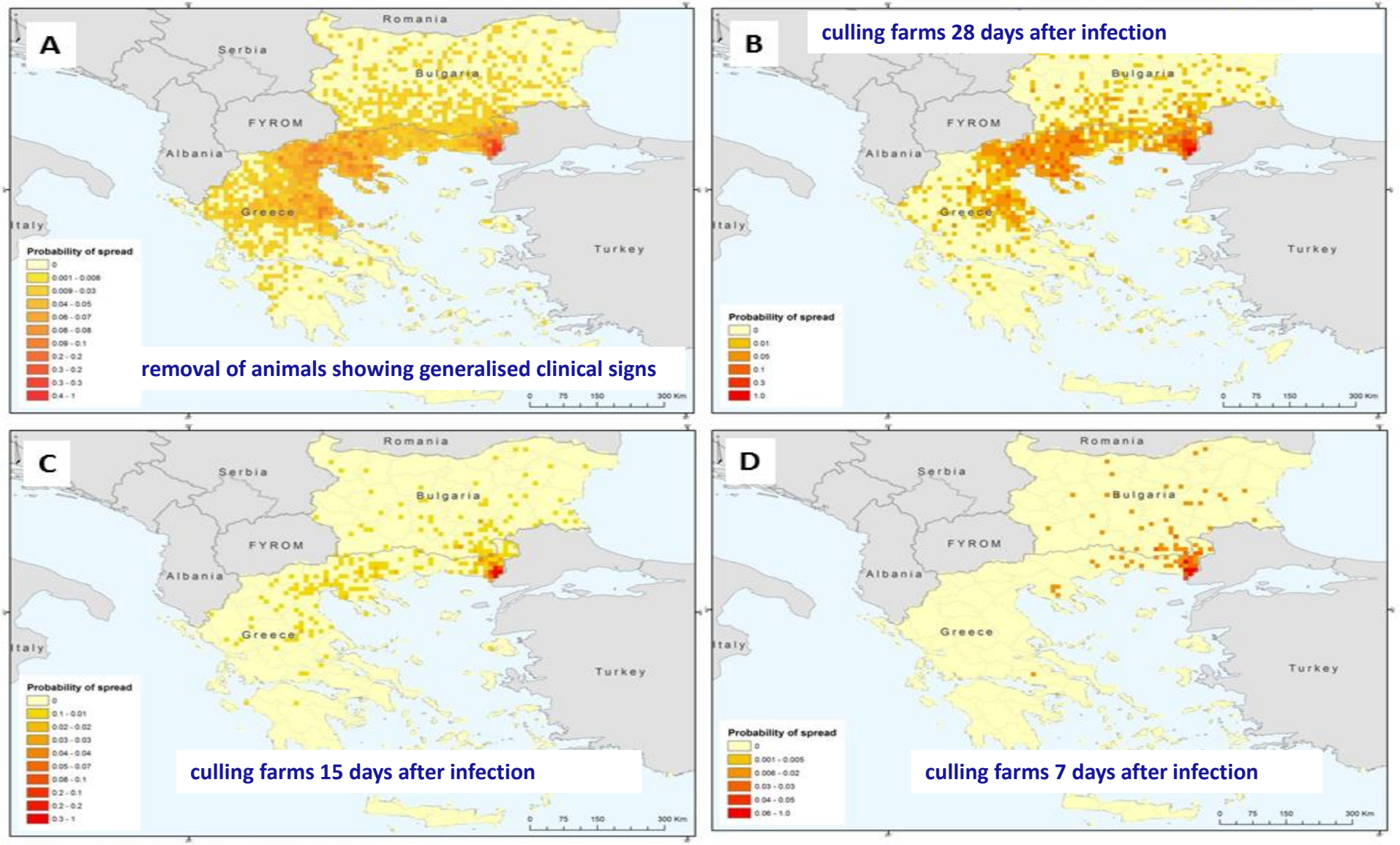
Selected conclusions - Spread and Impact of LSD

Spread

- Stochastic model simulating LSD spread between farms simulating an incursion in Greece:
  - removal of animals showing generalised clinical signs
- approximately 90 % of the simulated epidemics remain confined to the region around the initial site of incursion
- approximately 10 % of simulated epidemics spread further to approximately 300 to 400 km from the site of introduction within six months after the incursion

Impact

- Stochastic model simulating LSD spread between farms simulating an incursion in Greece:
  - removal of all animals in affected herds
- Applying **whole-herd culling to infected farms** substantially reduces the spread of LSDV
  - the more rapidly farms are detected and culled, the greater the magnitude of spread reduction



Simulated spread of lumpy skin disease (LSD) in Bulgaria and Greece when control is (A) by removal of animals showing generalised clinical signs; (B) by culling farms 28 days after infection; (C) by culling farms 15 days after infection; (D) by culling farms 7 days after infection. The map shows the proportion of simulations (indicated by the scale bar) for which at least one farm in a 0.1˚ by 0.1˚ grid square became infected. The model was run from the time of incursion (assumed to be 30 May) until 31 December.

Selected conclusions

Control measures

- Rapid laboratory confirmation essential for successful eradication.
- Large epidemics controlled by vaccination with homologous vaccine AND culling of animals with generalised symptoms
- The Neethling attenuated lumpy skin disease virus vaccine is highly effective BUT safety issues have been reported linked to generalized clinical reactions due to the vaccination
- No evidence to prove effectiveness of insecticide in controlling LSD morbidity

II. EFSA/DG SANTE LSD WORKSHOP 11-12 MAY 2016

Objectives

- reviewing the latest information and scientific knowledge available on LSD
- increasing the awareness about the epidemiological situation
- establishing synergies at regional level for the improvement of LSD surveillance, prevention and control

Participants

- Representatives of Albania, Bosnia and Herzegovina, Bulgaria, Cyprus, Greece, Israel, Jordan, Kosovo, Lebanon, Montenegro, Serbia, Romania, Russian Federation, the Former Yugoslav Republic of Macedonia and Turkey nominated by their National Competent Authorities
- Representatives of EFSA, DG SANTE, FAO, REMESA, OIE Reference Laboratory on capripoxviruses Pirbright Institute, CODA CERVA

II. EFSA/DG SANTE LSD WORKSHOP 11-12 MAY 2016

Key messages

- The homologous vaccine against LSD is the best choice for preventing LSDV infections
- With the current infection models, no spread of vaccine virus from vaccinated to non-vaccinated animals has been demonstrated in experimental studies
- Purity and potency checks of the available homologous vaccines should be carried out
- Availability and timely procurement of vaccines are essential for disease control by vaccination
- The iatrogenic transmission of LSD, e.g. by using the same needle for vaccination or treatment of several animals, should be avoided
- Importance of maximised biosecurity measures in farms located within and outside restriction zones

Knowledge gaps

- possibility of the biological mode of LSDV transmission by vectors
- transmission of LSDV: role of different European arthropod species, importance of direct contact between animals, and ingestion of contaminated milk, water or feed
- presence/survival of infectious virus in different cattle tissues and products (especially milk, milk products); potential transmission routes for live virus from animal products to live naïve hosts
- effective DIVA (Differentiating Infected from Vaccinated Animals) and inactivated vaccines against LSDV
- serological differentiation of LSDV-infected and vaccinated animals
- immune response of cattle to LSDV infection
- phylogeny of both field and vaccine LSDV strains
- reliable, specific and sensitive serological and DNA-based diagnostic tests for LSD, suitable for high throughput screening, providing accurate differentiation of infected and vaccinated animals

Needs and opportunities expressed by countries

- Training for prevention and control of LSD
  - contingency planning
  - good emergency practices
  - organising awareness raising campaigns for LSD prevention and control
- Access to LSD vaccines
- Laboratory equipment, consumables and training on LSD laboratory diagnosis
- Online repository of the information material and personal contacts

Workshop report to be published on www.efsa.europa.eu

III. EFSA STATEMENT ON LSD, 31 JULY 2016

Terms of Reference

- to assess the implications on disease spread and persistence of the implementation of a partial stamping-out policy (killing and destruction of clinically affected animals only) in holdings where the presence of Lumpy Skin Disease has been confirmed, against the current EFSA's advice and policy in place for total stamping-out of infected herds coupled with vaccination

III. EFSA STATEMENT ON LSD, 31 JULY 2016

EFSA Interpretation of Terms of Reference

- effect of a partial stamping-out policy, i.e. culling of animals showing clinical signs in herds which have been shown to be infected with LSDV, on the spread of LSDV has already been assessed for non-vaccinated herds (EFSA SO 2015)
- different combinations of stamping-out and vaccination policies will be assessed
  - effect of different stamping-out policies on the spread of LSDV will be assessed for herds vaccinated in an emergency vaccination programme (i.e. vaccination against LSD started only after the virus had been detected for the first time in a country, "reactive vaccination")
  - effect of different stamping-out policies on the spread of LSDV will be assessed for herds vaccinated in an preventive vaccination programme (i.e. vaccination of susceptible animals before the virus presence has been identified in a country, "proactive vaccination")
- risk of subclinical persistence of LSDV in a vaccinated population will be explored

III. EFSA STATEMENT ON LSD, 31 JULY 2016

Scenarios to be explored (TBC)

		Stamping out		
		total	partial	none
Vaccination	preventive	Scenario 1	Scenario 2	Scenario 3
	reactive	Scenario 4	Scenario 5	Scenario 6
	none	Scenario 7	Scenario 8	Scenario 9

III. EFSA STATEMENT ON LSD, 31 JULY 2016

Data

Greece

- size and location of bovine herds per municipality and municipal department
- ADNS data on LSD outbreaks from August 2015 until June 2016
- dates of vaccination per farm and per regional unit since the beginning of the campaign
- clinical cases in vaccinated herds with dates of appearance of symptoms and identification of virus type (field or vaccine strain)

Bulgaria

- size and location of bovine herds per municipality and municipal department
- ADNS data on LSD outbreaks from April 2016 until May 2016
- dates of vaccination per farm, number of animals vaccinated at NUTS3 level including municipality and settlement

III. EFSA STATEMENT ON LSD, 31 JULY 2016

Methodology

Stochastic kernel-based model simulating geographical spread of LSDV between farms

- baseline force of infection in the model estimated from data of location and time of infection for reported cases of LSDV from epidemic in Israel during 2012 and 2013 (control measures implemented: removal of animals showing generalised clinical signs of LSD and vaccination with a single sheep dose of RM-65 sheep pox vaccine, thought to be ineffective in controlling the spread of LSDV; scenario without any vaccination nor total stamping out)
- Different values of vaccination effectiveness are considered in the scenarios: 75% as in Ben-Gera (2015) and as calculated from the data from Greece and Bulgaria
- The delay between suspicion and implementation of stamping out based on the distribution of data on interval between date of LSD suspicion in herd and culling of herd as obtained from Bulgaria and Greece
- initial incursion assumed to result in the infection of the same three farms in the Evros region of Greece, bordering Turkey.

Thank you for your attention!

Acknowledgements to the team!

- AHAW Panel
- Experts
- Member States' CA
- EFSA staff

Model parameterisation (TBC)

- initial LSD incursion in Evros
- outbreak reported 1-2 weeks after infection (reflects incubation period of LSD
- Partial stamping out : reducing outbreak duration on reported farms (from 180 days with no stamping out to 50 days with partial stamping out).
- Total stamping out : removing the farm a certain time after reporting, with the delay between reporting and culling based on that observed in Bulgaria and Greece.
- delay between reporting and culling: data from Bulgaria and Greece
- Preventive vaccination: whole country fully immunised by the time of disease incursion
- vaccine effectiveness : either 75% or 40% (Ben-Gera et al. (2015); estimations from real data
- vaccine coverage: 95% (as if compulsory vaccination)