BLUETONGUE VIRUS OF SEROTYPE 8 OCCURENCE IN CYPRUS

BLUETONGUE VIRUS (BTV)

- BTV vertebrate hosts include domestic and wild ruminants; sheep, goats, cattle, buffaloes, deer, most species of African antelope and other Artiodactyla such as camels
- Transmission through the bite of certain species of *Culicoides* midges (biological vectors)
- Non-contagious by casual contact
- Cattle, goats, camels, wild ruminants generally present inapparent infection
- Severe clinical signs are most commonly seen in improved breeds of sheep
- BTV does not establish persistent infections in ruminants
- Survival of the agent in the environment is associated with insect factors (rainfall, temperature, humidity and soil characteristics)

CULICOIDES

- Culicoides has nearly 1,400 worldwide distributed species (at least 117 in Europe) and it is characterised by a diversity of biting midges
- Haematophagous females can transmit a variety of filarial worms, protozoans and arthropod-borne viruses to man and wild or domestic animals (Foxi et al., <u>2016</u>)
- Only around 30 species of *Culicoides* have been associated with BTV transmission
- C. imicola, C. obsoletus and C. scoticus are presently considered confirmed BTV vectors, while C. chiopterus, C. dewulfi, C. pulicaris and C. punctatus as probable vectors (Purse et al., <u>2015</u>; Foxi et al., <u>2016</u>)
- Continuous Culicoides activity could occur almost throughout the year, at least during years when temperatures allow that in Mediterranean areas and in mild-winter areas

- Culicoides species are holometabolic (undergo complete metamorphosis)
- Adult midges usually live for about 20 days, depending on ambient conditions they can live for more than 90 days
- The female midges require blood meals for the maturation of their eggs
- Between 100 and 200 eggs are usually laid in areas with a specific humidity (damp, muddy areas) and abundant organic material (faecal and plant matter)
- Development from egg to adult usually takes about 15 days but can be up to up to several months during the overwintering period

Life cycle of *Culicoides imicola* (G. Benelli et al. 2017)



BTV IN EUROPE

- Prior to 1998, BTV rarely occurred in Europe outside of Cyprus and the Iberian peninsula (Mellor et al. 2008), although a brief outbreak of BTV-4 occurred on the Greek island of Lesbos between October and December 1979 (Mastroyanni et al.,<u>1981</u>) and antibodies to BTV were detected shortly afterwards in animals on the Greek island of Rhodes (Dragonas, <u>1981</u>)
- In August 2006, the Dutch confirmed the first ever case of BTV infection in Western Europe
- During the following months, this outbreak spread to infect animals on over 2000 holdings in the Netherlands, Belgium, Germany, France and Luxembourg, before cold weather interrupted transmission

BTV IN CYPRUS

- The disease has been present in Cyprus since 1924
- The first suggestion that species of *Culicoides* might be able to transmit BTV in the field was indicated by the isolation of BTV-4 from *C. obsoletus* group females during an outbreak in Cyprus (Mellor and Pitzolis, <u>1979)</u>
- Last outbreaks in 2003, 2006, 2010, 2011 και 2014 (serotypes: 4, 16)
- The whole territory of Cyprus was classified as restricted for serotypes 4 and 16
- Considering the island's dimensions and combined with the biology of the BTV, the whole territory of Cyprus is considered as protection zone (a radius of at least 100 kilometers around the infected holding) in case of an outbreak

BTV-8 IN CYPRUS IN 2016

- Circulation of a new serotype
- Clinical symptoms in sheep were notified to the Veterinary Services on the 19th September, 2016
- Symptoms observed:
 - Excessive salivation, fever, ulcerative and necrotic lesions of the oral mucosa, nasal discharge, swollen head, lameness, abortions
- The NRL confirmed the presence of BTV on September 20th by Real-Time PCR technique
- The European Reference Laboratory, The Pirbright Institute confirmed on the 30th September that the cases were attributed to BTV-8.





MEASURES IN PLACE

- The involved stakeholders had been respectively informed of the disease, the virus biology, the clinical symptoms attributed to BTV infection, the measures to be taken on their part
- Movement restrictions of susceptible animals
- On the spot inspections of holdings with susceptible animals
- Sampling of animals with clinical signs
- Use of insecticides on animals
- Use of insect repellents for animal housing and water reservoirs
- In February 2017 a mass vaccination campaign has commenced with an inactivated BTV-8 vaccine which has almost covered the whole population of sheep, goats and cattle

DISTRIBUTION OF CATTLE, SHEEP AND GOAT FARMS IN CYPRUS



OUTBREAKS SEPTEMBER 2016



OUTBREAKS SEPTEMBER AND OCTOBER 2016



OUTBREAKS SEPTEMBER, OCTOBER AND NOVEMBER 2016



OUTBREAKS SEPTEMBER, OCTOBER, NOVEMBER AND DECEMBER 2016



EPIDEMIOLOGICAL FACTS

- 171 outbreaks 82 sheep and goat, 77 sheep, 9 cattle and 3 goat farms - declared to the World Organization for Animal Health (OIE)
- Mortality mainly occurred in pregnant ewes or ewes after lambing
- Abortions were recorded and ewes gave birth to stillborn or weak lambs or delivered malformed lambs
- Cattle and goats were found harboring the virus when serological testing prior to movement licensing was conducted

CONCLUSIONS

- None outbreak since December 2016
- Vaccination is an effective tool to protect animals from BTV
- Economic loses due to trade restrictions, mortality, reduction in milk yield and fertility