

SURVEILLANCE OF BITING MIDGES: DETERMINING VECTOR-FREE PERIODS IN SWITZERLAND FROM 2007 TO 2009

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Since the introduction of bluetongue virus serotype 8 (BTV-8) in Northern Europe, a surveillance of the disease has been implemented in Switzerland, based on a collaborative network including the Swiss Federal Veterinary Office, the Institute of Virology and Immunoprophylaxis and the Institute of Parasitology (IPZ). In accordance with European regulations, the surveillance aims at determining zones which are seasonally free of bluetongue by showing lack of evidence of disease transmission or of activity of competent vectors. The results of two years (2007–2009) of surveillance of the winter activity of biting midges are presented. BT zones were identified for Switzerland and Liechtenstein based on (i) the 45x45 km grid, (ii) a spatial risk analysis on the occurrence of biting midges and susceptible livestock, and (iii) the limits of the Swiss administrative units (cantons). Thus, 16 BT zones were defined, comparable in area size (as 'risk' areas) and in populations of cattle, sheep and goats. Insects were caught with Onderstepoort ultraviolet-light traps once weekly at 19 stations, outdoors, from dusk to dawn, and from October to May. Trapping was maintained at six stations during the midge activity season. Trappings were implemented by volunteer farmers or local veterinary offices, and samples were sent to the Swiss reference laboratory for vector entomology (IPZ) where midge activity was classified from 'no activity' to 'very high activity'. Midges were caught at all stations, but in very different numbers. From mid-November 2007 until end of March 2008 there was a period of very low *Culicoides* activity (catches without midges or

below the threshold of 10 midges/trap/night). Then, the activity increased gradually, and the vector-free period was defined as ending on April 15th. All sites showed activity during the whole summer, globally with a decrease from July to September. The highest activity was recorded in Northern Switzerland (Basel), with an average of 3268 midges/trap/night. Surprisingly, the highest activity was not observed in Southern Switzerland where the mild climate is influenced by the Mediterranean Sea, but north of the Alps characterized by an Atlantic climate. During October to mid-November 2008, midge activity decreased, and less than 10 midges or 5 parous midges/trap/night were caught at all sites after mid-November. The vector-free period was thus determined as starting on December 15, 2008. Then, a very low activity was observed in Basel during early January, and no activity was observed in the cantons until the first week of March 2009. Very few midges were trapped until beginning of April, and first parous and blood-fed females were caught after mid-April. Thus, the vector-free period was declared to end on April 20, 2009. Vector-free periods could be defined for the whole of Switzerland during the two years of winter surveillance. A third year of surveillance is ongoing, and three-years' data will be analysed for a possible extrapolation of an annual vector-free period.

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