

# Establishment of an early warning system for vector-borne diseases in Switzerland

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## Schlüsselwörter

Bluetongue, early warning system, vector-borne diseases, sentinel herd surveillance

## Problemstellung und Zielsetzung

The aim of this study was to develop and implement a sentinel herd surveillance program with the main purpose of serving as an early warning system for selected vector-borne diseases in farm animals. This would be fulfilled through i) Determining the immune status of the selected sentinel herds in terms of the following three diseases: BT, cattle anaplasmosis and cattle babesiosis, ii) Studying the abundance, distribution and population composition of BT vectors in Switzerland and finally, iii) identifying areas of higher risk for disease incursion as well as vector establishment.

## Material und Methoden

The project was composed of a serological and an entomological sampling program. Blood samples from sentinel cattle were taken once per year at the end of vector season (November-January) from all sentinel farms. In 2004 this amounted to 12 farms, and by 2006 14 farms were being tested. Entomological sampling took place in the months of June-October with main focus on Ticino (7 farms) and additional trapping sites in Basel (1 farm) and Zurich (1 farm). Thematic Maps were created through ArcGis (Version 8.3, Environmental Systems Research Institute, Inc.) to visualize areas considered at higher risk of BT through presence and activity rates of vectors, along with mathematical models predicting the scale of a BT outbreak depending on area of initial occurrence.

## Ergebnisse und Bedeutung

During the project, no BT was detected in the sentinel farms, although the presence of BT vectors was confirmed. *A. marginale* and *B. divergens* were also negative except for some background presence especially in samples collected from the western part of Switzerland. No conclusive agent was detected since tests used are cross reactive with other *Anaplasma* and *Babesia* species. Maps created highlighted many areas of Switzerland as highly suitable for vector presence, and transmission values calculated correspond with actual BT prevalence rates from the first CH outbreaks of 2007.

## Publikationen Poster und Präsentationen

Racloz, V.; Presi, P.; Vounatsou, P.; Schwermer, H.; Casati, S.; Vanzetti, T.; Griot, C.; Stärk, K.D. 2007. Use of GIS maps and statistical modeling for the prediction of Bluetongue disease occurrence in Switzerland based on vector biology. Veterinaria Italiana. 43 (3)

Racloz, V.; Griot, C.; Stärk, K.D. 2006. Review of sentinel surveillance systems with special focus on vector-borne diseases. Animal Health Research Reviews. Dec;7:71-9

Racloz, V.; Straver, R.; Kuhn, M.; Thur, B.; Vanzetti, V.; Stärk, K.D.C.; Griot, C.; Cagienard, A. (2006) Establishment of an early warning system against Bluetongue virus in Switzerland. SAT 148: 11, 593-598.

Casati, S.; Racloz, V.; Delécolle, J.C.; Kuhn, M.; Mathis, A.; Griot, C.; Stärk, K.D.C.; Vanzetti, T. Entomological monitoring of bluetongue vectors at sentinel sites in southern Switzerland: an investigation on the Culicoides population composition. Medical and Veterinary Entomology (submitted)

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