



The surveillance programme for bluetongue in Norway 2023



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The surveillance programme for bluetongue in Norway 2023

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Summary

All bulk milk samples collected in 2023 were negative for antibodies against Bluetongue virus.

Introduction

Bluetongue is a disease caused by Bluetongue virus (BTV) which comprises at least 27 serotypes (BTV 1-27). The virus is insect-borne and midges of genus *Culicoides* transmit BTV to susceptible ruminants after being infected by feeding on viraemic animals. After replication in the insect's salivary glands, which depends upon ambient temperature, the virus can be transmitted to new vertebrate hosts. Therefore, infection has a seasonal occurrence (1).

In 2006 an outbreak of bluetongue caused by serotype 8 (BTV 8) started in the Netherlands and rapidly spread among the ruminant population in European countries the following years. Therefore, a surveillance programme for BTV 8 based on bulk milk serology was conducted in Norway in 2008, and four cattle herds in the southern part of Norway were found seropositive for BTV 8. After two years of comprehensive monitoring and surveillance of BTV 8 without any further discovery of infected herds, Norway was regarded as free from bluetongue. Since then, the surveillance programme for BTV has been a less comprehensive programme based on bulk milk serology (2-4). Bluetongue is a list 1 disease in Norway and is listed by World Organisation for Animal Health. Bluetongue is a category C, D and E disease in the EU. Norway has not applied for official free status from the ESA/EU, and does not currently have official free status for bluetongue.

The surveillance programme consists of both screening of bulk milk for antibodies against BTV and vector surveillance. The Norwegian Food Safety Authority is responsible for implementing the surveillance programme for bluetongue. The Norwegian Veterinary Institute is in charge of designing the programme, collecting the bulk milk samples from the dairies and performing the tests. The Norwegian Veterinary Institute is also responsible for organising the collection of midges.

Aim

The aim of the surveillance programme for bluetongue is to document freedom from the infection in Norway, and to contribute to the maintenance of this favourable situation.

Materials and methods

The target population of dairy herds consisted of all cattle herds delivering milk to dairies during the sampling period in November, after the end of the vector season. Bulk milk samples were collected from 525 dairy herds from counties in the southern part of Norway. The number of herds per county and the number of herds tested in the surveillance programme for bluetongue in 2023 is given in Table 1.

Table 1: Number of dairy herds in selected counties and numbers of dairy herds tested in the surveillance programme for bluetongue in Norway in 2023.

County	Number of dairy herds*	Number of dairy herds tested
Oslo	2	2
Viken	347	181
Vestfold and Telemark	124	54
Agder	262	152
Rogaland	1 020	136
Total	1 755	525

* Based on data from the Register of production subsidies as of 1st of October 2023.

The samples were analysed with an Indirect ELISA ID Screen® Blue Tongue Milk (ID.Vet, Grabels, France) for detection of antibodies against BTV (5). Samples with inconclusive or seropositive ELISA results were re-tested in duplicates with the same ELISA. In case of positive bulk milk test, blood samples from all lactating dairy cows in the suspected herd would be examined for antibodies with the ID Screen® Bluetongue Competition ELISA (ID.Vet, Grabels, France). In case of seropositive animals, all animals in the herd would be examined for BTV with real time RT-PCR (6).

The vector surveillance started in April 2023 and ended in November 2023. Two sampling periods were intended - one in spring and one in autumn. Onderstepoort blacklight suction traps were used for collection of the midges. The traps were located at five farms along the Norwegian south coast (figure 1) and the farmers were responsible for capturing and submitting the samples to the laboratory. The trap was to be placed in close proximity to farm animals and to be active one day (and night), one day per week in the designated sampling periods. After collecting the sample from the trap the catch was transferred to a container with ethanol and shipped to the laboratory. Only one trap was active in the spring period, whereas all five were active in the autumn sampling period.

At the laboratory the collections were examined using stereomicroscope. Other insects in the catch were discarded and the *Culicoides* in the samples were designated to 3 categories; *Culicoides obsoletus* complex, *Culicoides pulicaris* complex and other *Culicoides* spp. using morphological criteria to designate the midges to the different categories.

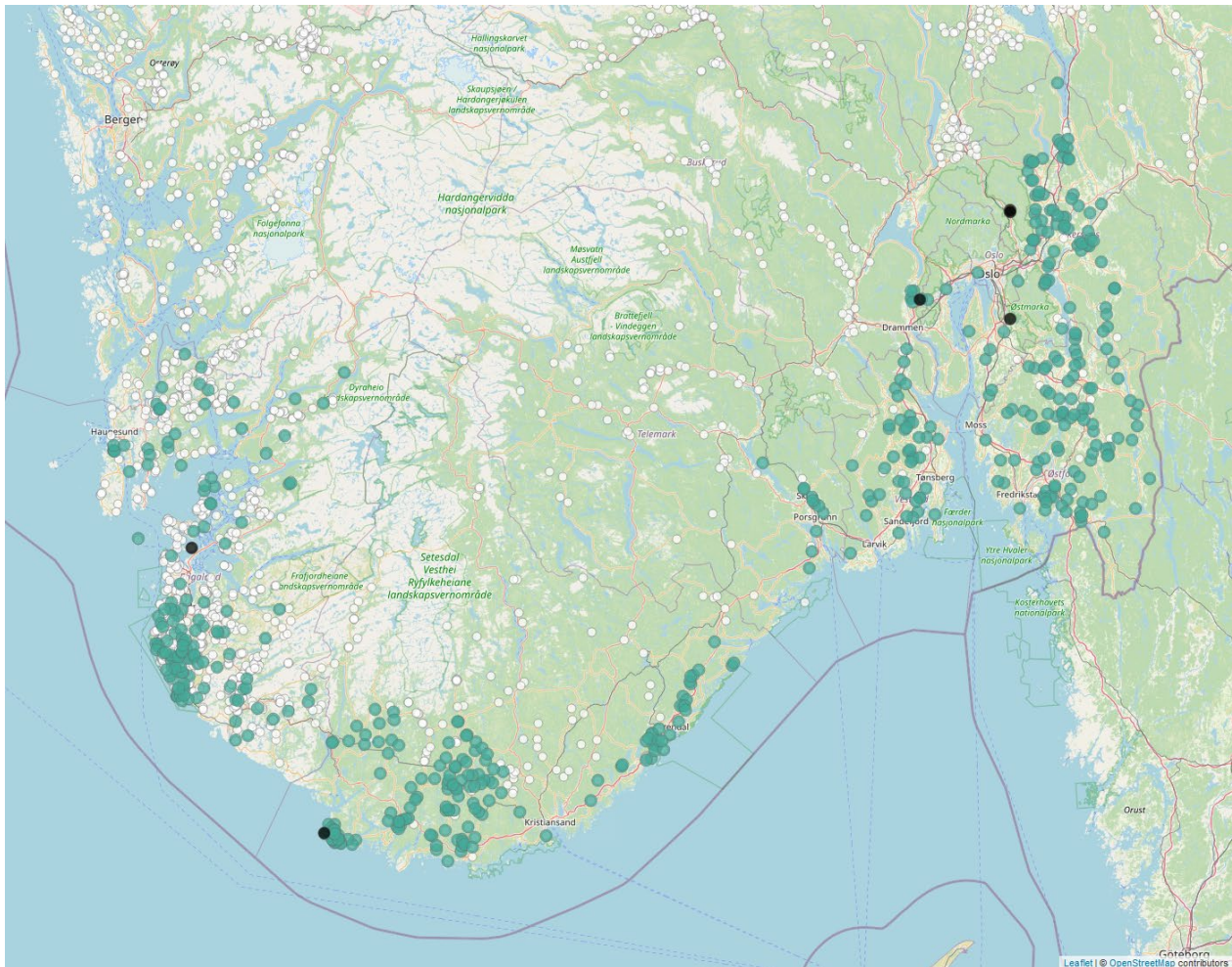


Figure 1: Testing for bluetongue virus antibodies in bulk milk from 525 Norwegian dairy herds in 2023. Green dots mark farms with negative results, while untested dairy farms are marked with white dots. Locations of midge traps are indicated with black dots.

Results and discussion

In 2023 we received and analysed bulk milk samples from 525 farms. All samples were negative for BTV antibodies. The virus has not been detected in Norway since 2009 (7), i.e. the population of dairy cattle has no antibodies against BTV.

The first midges were caught in late April (25.04.2023) and the last at the end of October (28.10.2023, fig 2.). A total of 45,233 *Culicoides* were caught during the surveillance period, which gives an average of 545 per catch (0 - 13,680). The dominating species in the trappings from 2023 belongs to the *C. obsoletus* complex, more than 95% of the caught midges belongs to this complex.

The results from the 2023 vector surveillance is comparable with results from earlier periods with BTV vector surveillance (2007-2009, 2022), both when it comes to when the midges start

and end their activity and the composition of species complexes and other *Culicoides* species.

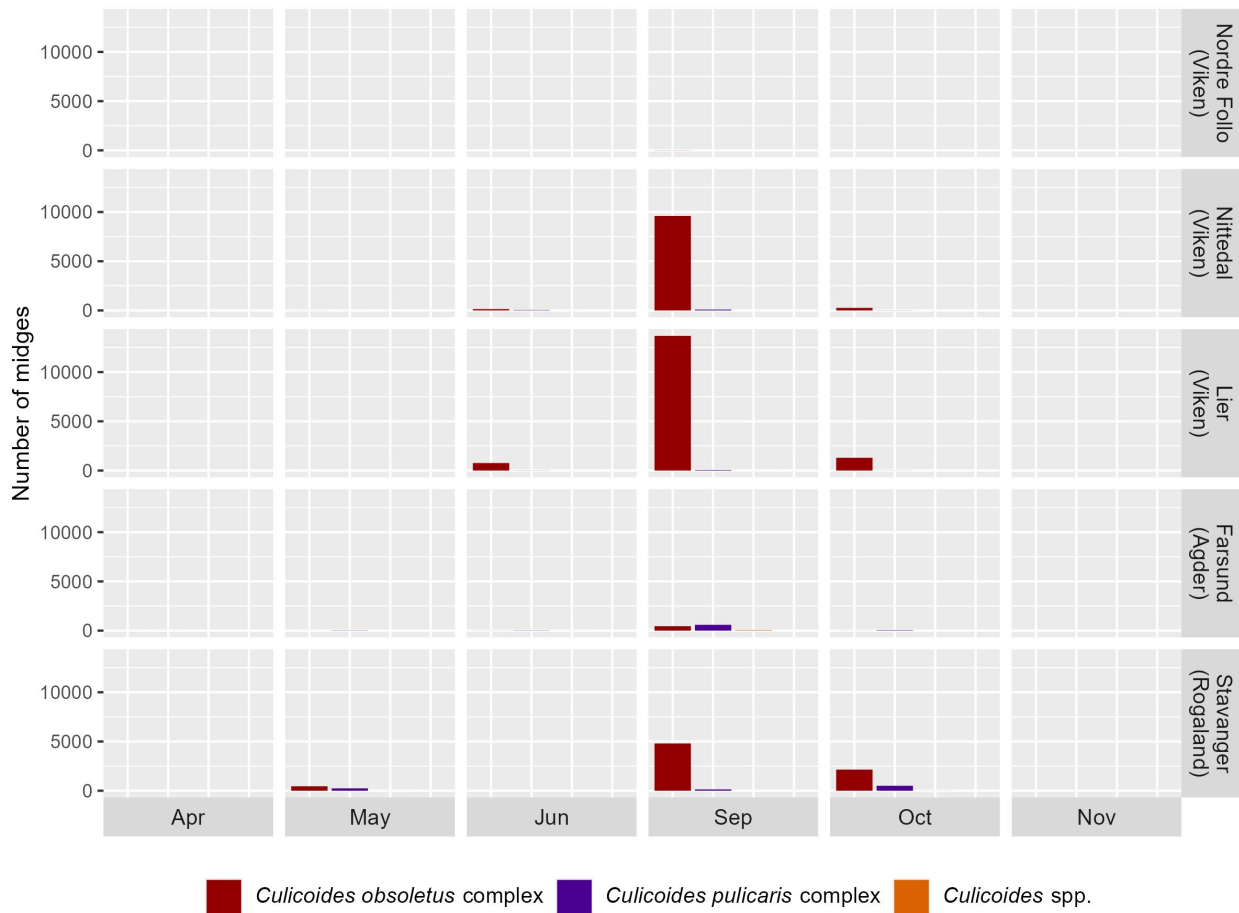


Figure 2: Maximum number of *Culicoides* captured per trap and month in the vector season in 2023.

The most likely method of bluetongue introduction to Norway would be either by import of infected animals or by airborne transfer of infected *Culicoides* (8). Imports of ruminants from EU countries not free from bluetongue, and all imports from countries outside EU, will be tested for the disease. The number of imported animals from either of these areas are very low or zero most years. The topography in Norway with hills and valleys makes it difficult for long distance transfer of *Culicoides* from one local area to another and there are relatively few ruminants per area compared to the rest of Europe, which makes it less likely for a wide spread of the agent if BTV should be reintroduced.

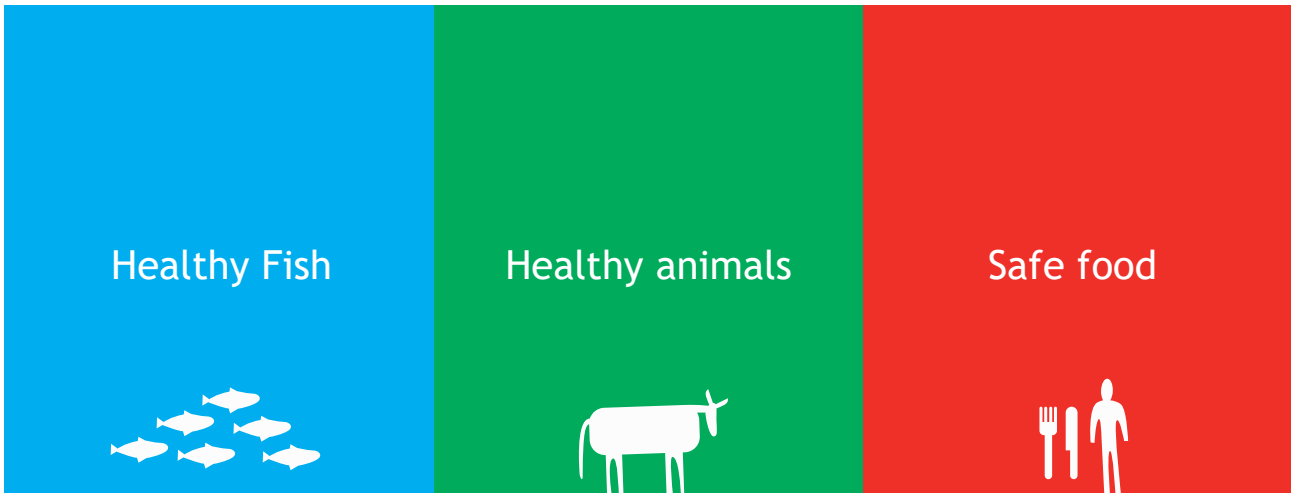
The most important purpose of the surveillance programme is to reveal potential infections brought in with airborne midges during the vector season. The most probable entry of windborne infected midges is in the southern part of Norway from the beginning of May until the end of October. Infected midges may come from Sweden, Denmark or Scotland. Testing of bulk milk collected from the end of October and onwards will detect infection introduced during the vector season.

Acknowledgement

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