Surveillance programmes for terrestrial and aquatic animals in Norway
Norwegian Veterinary Institute

Annual Report · 2014

The surveillance programme for *Trichinella spp.* and specific pathogenic viruses and bacteria in wild boar (*Sus scrofa*) in Norway. Hunting season 2014

Knut Madslien
Siri Kulberg Sjurseth
Inger Sofie Hamnes
Carl Andreas Grøntvedt

Veterinærinstituttet
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Project managers at the Norwegian Veterinary Institute:
Ståle Sviland (Terrestrial animals)
Anne-Gerd Gjevre (Aquatic animals)
Mona Torp (Food safety)

Publisher
Norwegian Veterinary Institute
PO Box 750 Sentrum
N-0106 Oslo
Norway

Fax: + 47 23 21 60 95
Tel: + 47 23 21 60 00
E-mail: postmottak@vetinst.no
www.vetinst.no

ISSN 1894-5678

Title:
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Authors:
Knut Madslien, Siri Kulberg Sjurseth, Inger Sofie Hamnes, Carl Andreas Grøntvedt

Date: 2015-04-30

Front page photo: Torsten Mörner

Example of citation:
Madslien K, Sjurseth SK, Hamnes IS, Grøntvedt CA. The surveillance programme for *Trichinella spp.* and specific pathogenic viruses and bacteria in wild boar (*Sus scrofa*) in Norway 2014. Surveillance programmes for terrestrial and aquatic animals in Norway. Annual report 2014. Oslo: Norwegian Veterinary Institute 2015.

The surveillance programme for *Trichinella* spp. and specific viral and bacterial infections in wild boar (*Sus scrofa*) in Norway 2014

Knut Madslien, Siri Kulberg Sjurseth, Inger Sofie Hamnes, Carl Andreas Grøntvedt

Trichinella *spp. and specific viral (AD, PRRS, PRCV, TGE, SI) and bacterial (*Mycoplasma hyopneumoniae*) infections were not detected in a wild boar (*Sus scrofa*) examined during the 2014 licensed hunting season.

Introduction

Surveillance for *Trichinella* in wildlife population is regarded as a tool for risk assessment in domestic animal (1). *Trichinella* spp. has never been detected in wild boar in Norway, but is reported annually in Sweden (2). The surveillance and control program for specific viral infections in Norwegian swine herds has for many years documented that the domestic swine population is free from AD, PRRS, PRCV, TGE and influenza A virus except the H1N1pdm strain, which was introduced into Norwegian swine herds in 2009 (3). The Norwegian pig population has been documented as free from *Mycoplasma hyopneumoniae* since 2009 (4).

Aim

The aim of the programme is to screen for *Trichinella* spp. and to ascertain the absence of specific viral (Aujeszky`s disease-virus/Pseudorabies virus, Porcine respiratory and reproductive syndrome-virus, Porcine respiratory corona virus, Transmissible gastroenteritis virus, Swine influenza virus) and bacterial (*M. hyopneumoniae*) infections in wild boar, in order to evaluate migrating wild boars as a risk factor for the health of domestic swine herds in Norway.

Material and methods

Sampling

Diaphragm muscle and blood from a single wild boar shot during the 2014 licensed hunting season (year round open season) were included in this year's program. Only the south-eastern part of Norway (Østfold County) was represented in the sampling regime. Hunters were invited to participate based on the list of registered wild boar hunters provided by Statistics Norway.

A standard form that included information on where and when the wild boar had been hunted, as well as the sex (male, female) and presumed age of the animal (juvenile, adult), was completed by the hunter.

Laboratory analyses

All analyses were performed at the Norwegian Veterinary Institute in Oslo. Positive or inconclusive results in the surveillance program were retested in duplicate with the same test method. The sample was concluded as negative if the retest gave a negative result. If the result of the retest was positive or inconclusive, a specified confirmatory test was performed.

Aujeszky's disease

Serum was tested for antibodies against AD virus using a commercial blocking ELISA kit from Svanovir (SVANOVIR® PRV gB-Ab). The test detects antibodies against glycoprotein B (previously glycoprotein II) found on the surface of the virus. A virus neutralisation test (VNT) was used as confirmatory test for positive or inconclusive results.

Porcine reproductive and respiratory syndrome

Serum was tested for antibodies against PRRS virus using a commercial indirect ELISA from IDEXX (IDEXX PRRS X3 Antibody Test), which detects the most (pre)dominant European and American strains of PRRS virus. In cases of positive or inconclusive results, the samples were sent to the National Veterinary Institute DTU in Denmark for confirmatory testing using ELISA and immuneperoxidase tests for detection of antibodies against EU- and US-strains of the PRRSV.

Transmissible gastroenteritis virus and porcine respiratory coronavirus
A commercial blocking ELISA from Svanovir (SVANOVIR® TGEV/PRCV-Ab) was used to detect antibodies against TGEV/PRCV. The ELISA test enables discrimination between antibodies to TGEV and PRCV in serum samples. In cases of positive or inconclusive results, the samples may be sent to the OIE reference laboratory.

Swine influenza virus
A commercial competitive ELISA from ID.vet (ID Screen® Influenza A Antibody Competition multi-species) were used to screen serum samples from wild boars for antibodies against influenza A virus. In cases of positive or inconclusive results, the serum samples were retested
using the haemagglutination inhibition test (HI), for the detection of antibodies against the H1N1pdm09 and European H1N1, H1N2 and H3N2 serotypes according to the method described in the OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals. The antigens for the tests were produced at the Norwegian Veterinary Institute.

Mycoplasma hyopneumoniae
Serum was tested for antibodies against *Mycoplasma hyopneumoniae* using a commercial blocking ELISA kit from Oxoid (*Mycoplasma hyopneumoniae* ELISA). The test detects antibodies against *Mycoplasma hyopneumoniae* antigens.

Trichinella
A minimum of 10 grams of muscle was examined using the reference method, magnetic stirrer method with HCl-pepsin digestion, as an individual sample in accordance with EU directive 2075/2005, annex 1 chapter 1 and annex III. A digestion time of 60 minutes was used (6). The sensitivity using this method, provided sufficient muscle from predilection sites is used, is estimated to be a minimum of 3-5 larvae per 100 grams of muscle (7).

The wild boar population in Norway is uncertain, but highly restricted and is essentially part of the Swedish population of around 150.000 wild boars (8) (Figure 1).

Results
Samples (blood and diaphragm muscle) from a single wild boar were collected during the 2014 hunting season (Figure 2) and these samples were adequate for examination. The samples were negative for *Trichinella* spp. and specific viral and bacterial pathogens for domestic swine. In total, 13 wild boars from Norway have been tested for *Trichinella* between 2011 and 2014.

Figure 1. Map of south-eastern Norway and bordering area in Sweden showing distribution and core area for wild boars in 2011. Modified with permission from the leaflet "*Villsvin - til glede og besvær*".

Figure 2. Map of Norway showing number and hunting municipality of a single wild boar examined for *Trichinella* spp. and specific viral and bacterial pathogens during the licensed hunting period in 2014.

Discussion

The 2014 result is in agreement with the results from previous years with *no* positive samples detected. However, the low sample size (n=1) must be taken into account when evaluating our results.

Nevertheless, this situation may change rapidly. The detection of African swine fever (ASF) in wild boar in Lithuania on January 24th 2014 (9) and later in Poland February 17th, its first detections in many years in the EU, with the exception of Sardinia, has significantly increased the risk of introduction of this disease with wild boars into Norway.

As a consequence, an annual surveillance programme of the joint wild boar population of Sweden and Norway is necessary to document continued disease free status. However, due to low number of samples received for analyses, the Norwegian surveillance programme for *Trichinella* spp. and specific pathogenic viruses and bacteria in wild boar was terminated in 2014.

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The Norwegian Veterinary Institute (NVI) is a nationwide research institute in the fields of animal health, fish health, and food safety. The primary mission of the NVI is to give research-based independent advisory support to ministries and governing authorities. Preparedness, diagnostics, surveillance, reference functions, risk assessments, and advisory and educational functions are the most important areas of operation.

The Norwegian Veterinary Institute has its main laboratory in Oslo, with regional laboratories in Sandnes, Bergen, Trondheim, Harstad og Tromsø, with about 360 employees in total.

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The NFSA comprises three administrative levels, and has some 1300 employees.

The NFSA advises and reports to the Ministry of Agriculture and Food, the Ministry of Fisheries and Coastal Affaires and the Ministry of Health and Care Services.

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