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The surveillance and control programme for avian influenza (AI) in wild birds in Norway

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Results were negative for the 2010 surveillance for highly pathogenic avian influenza virus in wild birds.

Introduction

The Norwegian Food Safety Authority is responsible for the implementation of the active surveillance programme for avian influenza (AI) in wild birds. The programme, which was started in 2005, is based on virological investigations in healthy, live or hunted birds. The Norwegian Veterinary Institute is responsible for planning, laboratory investigations and reporting components of the programme. The programme was suspended in 2008.

AI is a serious, highly contagious disease of poultry and other captive birds caused by many different subtypes of influenza type A viruses. The level of risks posed by the different subtypes to animal and public health is very variable, and are sometimes unpredictable. This is due to rapid virus mutation and possible re-assortment of the genetic material between different subtypes.

Wild waterfowls are the natural reservoirs for all influenza A virus subtypes. Infected birds do not usually develop clinical disease, but shed large amounts of virus in their faeces (1). The highly pathogenic avian influenza (HPAI) virus H5N1 is primarily shed via the airways (2).

HPAI has never been reported in wild birds in Norway.

Aims

The aim of the national surveillance programme for AI in wild birds is to study and understand the threats posed by wild birds in relation to influenza viruses of avian origin, with special emphasis on H5 and H7 viruses.

Materials and methods

In 2010 the programme for wild birds consisted of molecular screening of cloacal and tracheal swabs from healthy birds shot during the 2010 hunting season. Sampling equipment consisted of a sample tube containing a virus transport medium. Swabs were sent to hunters in the county of Rogaland (South-Western Norway). Choice of hunters was based on their proficiency during previous hunting seasons. The hunters were also given written instructions on how to collect the sample. They were requested to fill in registration forms for individual birds. The swabs were taken from shot birds, placed in the transport medium and sent by overnight post to the National Veterinary Institute in Oslo. The samples were frozen at -70 °C upon arrival.

The sampling comprised the following species shown in Table 1.

H5/H7

The samples were registered upon arrival and screened using a real-time reverse transcriptase polymerase chain reaction (rRT-PCR). The screening rRT-PCR used was a pan-influenza A virus rRT-PCR that reveals the presence of all subtypes of influenza type A virus. The method does not, however, give information as to which hemagglutinin (HA) or neuraminidase (NA) subtype is present in influenza positive samples. Therefore, the samples found to be positive in the initial pan-influenza A virus RT-PCR were further subtyped, using rRT-PCRs specific for H5 and H7 or RT-PCRs for amplification of the full-length HA and NA genes. Samples positive for the pan-influenza A virus rRT-PCR were also inoculated in embryonated eggs for virus isolation following the procedures described in the OIE Manual (3), with some minor modifications.

Results

In total, samples from 507 birds were received. Of these where 6 samples rejected from examination leaving 501 for analysis. Of these, 92 were positive for influenza A virus. None of the samples were positive for HPAI viruses.

The prevalence for influenza A virus in waterfowls in which the virus was isolated was: Common Teal 28.5 % (39/137), Mallard 20.5 % (41/200) and Eurasian Widgeon 12.5 % (3/24).

And in other gulls; Common Gull 3.1 % (1/32) and Herring Gull 6.5 % (5/77).

All of these samples have been tested for the presence of subtype H5 and H7, with the exception of one sample not tested for H7. None of the samples were H7 positive. One Mallard were found to carry H5 subtypes. Sequencing of the HA gene has identified this virus as low pathogenic avian influenza (LPAI) virus.

The other subtypes identified include H3N2, H3, LPAI H5N2,H6N2, H6, H11, H16N3, N5 and N8.

Discussion

Similar to previous years, amongst the waterfowl there were positive samples from Mallards, Widgeons and Teals this year. Unfortunately, the national surveillance programme for AI in wild birds was suspended in 2008, so comparisons must be made with previous years (Table 2). Also, the dramatic cut in the number of birds sampled resulted in all the samples being taken from one area in the country, Rogaland county. This area was chosen due to the relative density of poultry operations in the area and their overlap with the flyways and resting areas of many species of waterfowl (4). But in comparison with the national surveillance programme for AI in wild birds in 2006 and 2007, the general prevalence of AI infection amongst wild birds tested in 2010 was higher (5, 6, 7).

Only three species of gull were sampled in 2010. Two of these, the Common Gull and the Herring Gull, were positive for influenza A infection. The Great Black-backed Gull was negative, however, this was also the Gull species that was least sampled (n=4).

Table 1. Birds examined in 2010 and the results of the examination for influenza virus.

Species	No. of examined	Negative	Influenza A	Low pathogenic H5	High pathogenic H5	Low pathogenic H7	High pathogenic H7
Duck family (Anatidae)	3	3	0	-	-	-	-
Mallard (*Anas platyrhynchos*)	200	159	41	1	0	0	0
Eurasian Wigeon (*A.. penelope*)	24	21	3	0	0	0	0
Common Teal (*A. crecca*)	137	98	39	0	0	0	0
Common Goldeneye (*Bucephala clangula*)	22	19	3	-	-	-	-
Herring Gull (*Larus argentatus*)	77	72	5	0	0	0	0
Great Black-Backed Gull (*L. marinus*)	4	4	0	-	-	-	-
Common Gull (*L. canus*)	32	31	1	0	0	0	0
Unknown	2	2	0	-	-	-	-
Total	**501**	**409**	**92**	**1**	**0**	**0**	**0**

Table 2. Birds examined 2006 to 2010 in the program for avian influenza and the results of the examinations (The programme was suspended in 2008).

Year	No. of examined	Negative	Influenza A	Low pathogenic H5	Low pathogenic H7	High pathogenic H5	High pathogenic H7
2006	1274	1189	85	0	0	0	0
2007	1528	1344	183	12	0	0	0
2008	0	-	-	-	-	-	-
2009	405	338	66	14	0	0	0
2010	501	409	92	1	0	0	0

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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 Norwegian Food Safety Authority (NFSA) is a governmental body whose aim is to ensure through regulations and controls that food and drinking water are as safe and healthy as possible for consumers and to promote plant, fish and animal health and ethical farming of fish and animals. We encourage environmentally friendly production and we also regulate and control cosmetics, veterinary medicines and animal health personnel. The NFSA drafts and provides information on legislation, performs risk-based inspections, monitors food safety, plant, fish and animal health, draws up contingency plans and provides updates on developments in our field of competence.

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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