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The surveillance programme for avian influenza (AI) in poultry in Norway 2023

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Content

Summary

Surveillance based on serological investigations to monitor avian influenza viruses (AIVs) in poultry in 2023 did not detect infection in poultry held for commercial purposes in Norway. In 2023, three outbreaks of highly pathogenic avian influenza (HPAI) occurred in domestic birds in Norway: one outbreak in a municipal park with captive birds and two outbreaks in backyard poultry flocks.

Introduction

Norway implements a surveillance programme for avian influenza (AI) in poultry establishments to detect occurrences of AIVs, in accordance with Commission Delegated Regulation (EU) 2020/689 (1). The Norwegian Food Safety Authority is responsible for this surveillance programme. Active surveillance, based on serological investigations of poultry, commenced in 2006. The Norwegian Veterinary Institute manages the planning, laboratory investigations, and reporting components of the programme.

Avian influenza is a highly contagious disease that affects poultry and other birds. It is caused by infection with numerous subtypes and strains of influenza A viruses. Current knowledge indicates that the health risks associated with low pathogenic avian influenza viruses (LPAIVs) are generally lower than those posed by highly pathogenic avian influenza viruses (HPAIVs). While the majority of LPAIV infections typically results in mild disease in poultry, HPAIVs can cause severe illness, often leading to mortality rates exceeding 90% (2).

While domestic poultry populations in Europe generally are free from AIVs, wild waterfowl serve as the primary reservoir for LPAIVs. Infected waterfowl can shed large amounts of the virus upon infection (2). Transmission of LPAIVs from the wild bird reservoir to poultry can occur without poultry demonstrating visible clinical signs. Rarely, LPAIVs may mutate to HPAIVs in this context.

HPAI and infections with LPAI subtypes H5 and H7 in poultry are categorized as list 1 diseases in Norway and are notifiable to the World Organisation for Animal Health (WOAH). In Norway, HPAI outbreaks occurred in two commercial poultry flocks per year in 2021 and 2022 (3).

Aims

The national surveillance programme for AI in poultry aims to document that the Norwegian poultry populations are free of influenza A virus of subtypes H5 and H7 and to contribute to maintaining this status.

Materials and methods

Flock selection and sampling

The programme in 2023 consisted of serological screening of blood samples from poultry. As outlined in the Commission Delegated Regulation (EU) 2020/689, risk-based surveillance complementary to passive surveillance in poultry should apply to poultry species that generally do not show significant clinical signs (ducks and geese), turkeys and laying hens including those kept free-range (1). The poultry flock selection in 2023 included all breeding flocks (chickens, turkeys, ducks and geese), fattening ducks, fattening geese, fattening turkeys and a selection of layer flocks including all organic free-range and some conventional flocks.

Annual blood samples are collected from ten birds within *Galliformes* flocks and 50 birds within *Anseriformes* flocks for serological screening. Furthermore, annual blood samples are obtained from ten birds within all organic, free-range layer flocks with more than 100 birds, as well as samples from a selection of flocks with conventional laying hens. At slaughter, ten birds are sampled from each fattening turkey flock, while 50 birds are sampled from all fattening duck and geese flocks. In cases where the flock size falls short of the required number of samples, all birds are sampled. If multiple sheds exist within the holding, samples are collected from all sheds.

Laboratory analyses

A multispecies competitive ELISA kit from IDvet (ID Screen® Influenza A Antibody Competition, multispecies) was used to screen serum samples for antibodies against influenza A virus. The test detects antibodies to all influenza A subtypes and antigenic variants by measuring their ability to compete with a monoclonal antibody against a highly conserved epitope of the influenza A virus nucleoprotein (NP).

Samples with positive or inconclusive results in the initial ELISA screening were retested in duplicates. Samples were concluded to be negative if retesting produced negative results.

In samples with inconclusive results from ELISA retesting, the subtype specificity was investigated by a haemagglutination inhibition (HI) test as described in the WOAH diagnostic manual (4) and by the European Reference Laboratory for Avian Influenza and Newcastle disease (EURL) (5). The antigens used in the HI test are listed in EU Commission Decision 2010/367/EC (6), and their relevance is tested yearly in the EURL proficiency test. The Animal and Plant Health Agency (Weybridge, United Kingdom) supplied Norway with the primary antigens H5N3 (A/teal/England/7894/06), H7N7 (A/turkey/England/647/77) and H5N8 (A/duck/England/14; ducks and geese only) and secondary antigens H5N1 (A chicken/Scotland/59) and H7N1 (A/African starling/983/79). Samples were concluded to be negative for subtypes H5 and H7 if the HI test results were negative.

Results and Discussion

Of 2,919 samples selected for AIV surveillance, 31 were not suitable for analysis, leaving 2,888 samples from 229 poultry flocks. Of these samples, 2,874 were negative, four inconclusive, and ten samples (0.34%) were positive during initial screening for antibodies to influenza A virus. Eight of the positive samples, and all samples with inconclusive results, were negative for antibodies when retested in duplicates.

One of the remaining screening-positive samples produced inconclusive results when repeated in duplicates in the ELISA, but tested negative for antibodies to H5 and H7 avian influenza virus in the HI test. This single sample was thus concluded to be negative for antibodies against subtypes H5 and H7. The rest of the samples taken from the same flock tested negative in the ELISA, supporting the likelihood that this single sample was indeed negative for antibodies against influenza A virus despite the inconclusive ELISA results.

The last screening-positive sample gave positive results when repeated in duplicates in the ELISA. After the repeated test, no sample remained for HI testing. The rest of the samples from the same flock tested negative in the ELISA. Subsequently, ten birds from the flock were resampled for follow-up. All these samples tested negative in the ELISA, leading to the conclusion that the flock was negative for antibodies against influenza A.

In conclusion, all poultry flocks tested in the surveillance programme for avian influenza were negative for antibodies to influenza A virus subtypes H5 and H7. Table 1 shows the number of flocks and birds tested in 2023.

***Table 1**: Number of breeding flocks, commercial flocks, and birds tested in the surveillance programme for AI in poultry in Norway in 2023.*

Species	Breeding flocks		Commercial flocks (laying hens and fattening turkeys/ducks/geese)		Total	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
Chicken	85	918	83	823	168	1 741
Turkey	5	50	44	449	52	499
Duck	2	100	10	500	12	600
Goose	0	0	1	48	1	48
Total	**92**	**1 068**	**138**	**1 820**	**229**	**2 888**

In addition to the surveillance programme, samples taken for diagnostic purposes and for the control of imported animals were also screened for antibodies against influenza A virus and, if results were positive, H5 and H7. Results from these analyses are not included in this report.

In April 2023, HPAI outbreaks occurred in a municipal park with captive birds in Kristiansund municipality (Møre and Romsdal county) and in one poultry backyard flock in Kvinnherad municipality (Vestland county). In October 2023, an additional outbreak in a backyard poultry

flock was confirmed, this time in Tromsø municipality (Troms and Finnmark county). The birds in all three holdings showed clinical signs compatible with HPAI and were sampled based on suspicion. HPAIV subtype H5N1 was detected by PCR tests of tracheal and cloacal swabs.

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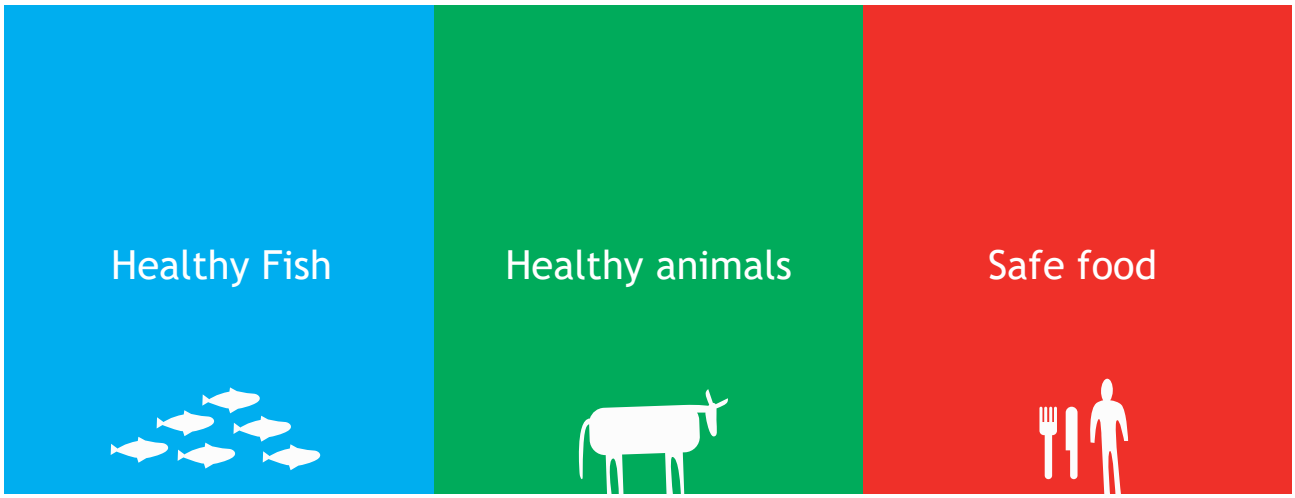

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