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# Content

# Summary

Surveillance based on serological investigations did not detect infection with highly pathogenic influenza A virus in poultry in 2021. In November 2021, outbreaks of highly pathogenic avian influenza (HPAI) occurred for the first time in commercial poultry in Norway. HPAI virus of the subtype A (H5N1) was detected by PCR in two commercial layer flocks in Klepp municipality in Rogaland County from samples taken upon suspicion.

# Introduction

The Norwegian Food Safety Authority is responsible for the surveillance programme for avian influenza (AI) in poultry. The programme, based on serological investigations of poultry modelled on EU's Council Directive 2005/94/EC (1), started in 2006. The Norwegian Veterinary Institute is responsible for planning, laboratory investigations and reporting components of the programmes.

AI is a serious and highly contagious disease in poultry and other birds caused by many subtypes of influenza A viruses. The risks posed by the different subtypes to animal and public health are variable due to rapid virus mutations and possible re-assortment of the genetic material between different subtypes.

Current knowledge indicates that the health risks posed by the so-called low pathogenic AI (LPAI) viruses are lower than that posed by highly pathogenic AI (HPAI) viruses. Most LPAI viruses cause only mild disease in poultry. The HPAI viruses have evolved from LPAI viruses of either H5 or H7 subtype. HPAI can cause disease in poultry resulting in mortality rates exceeding 90 %.

In general, domestic poultry populations are free from AI viruses. However, wild waterfowls are the natural reservoirs for all LPAI virus subtypes, and the current circulation of HPAI viruses in the wild bird population in Europe represents a persistent biosecurity risk to domestic poultry holdings (2). Infected waterfowl do not usually develop clinical disease, but may shed large amounts of the virus upon infection (3). The spread of AI from the wild bird reservoir to poultry happens with increasing frequency, and, rarely, some LPAI viruses may mutate to HPAI in this context.

HPAI and infections of LPAI H5 and H7 in poultry are classified as list-1 diseases in Norway and are notifiable to the World Organisation for Animal Health (WOAH). Up to 2020, AI had not been reported or diagnosed in Norwegian poultry in Norway (4).

# 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 2021 consisted of serological screening of blood samples from poultry. As outlined in the Commission Decision 2010/367/EC (5), there is a preferential sampling of poultry deemed at risk for exposure to influenza type A. The sample selection was based on a risk assessment published by the Norwegian Veterinary Institute in February 2006 (6). The sample selection in 2021 included chickens, turkeys, ducks and geese.

In addition to risk-based sampling from farms with table egg production (including all organic table egg producers with >100 layers) and turkey farms, AI surveillance also includes breeding flocks. National regulations for certification of poultry breeding farms require blood samples from 60 birds per breeding flock annually for screening for Newcastle disease antibodies, as Norway is a non-vaccinating country (7). Ten of these 60 samples are also included in the national surveillance programme for AI.

For non-breeding flocks, blood samples were collected from at least ten birds per holding. An exception to this scheme was sampling of flocks with waterfowl, from which 50 blood samples were collected. If the flock size was less than the number required, all birds in the flock were sampled. If there were more than one shed on the holding, all sheds were sampled.

## Laboratory analyses

A competitive multispecies 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).

In cases of positive ELISA results the findings were confirmed by a haemagglutination-inhibition (HI) test as described in the WOAH diagnostic manual (8). Antigens used in the HI test were designated by the EU reference laboratory (EURL) for avian influenza (Istituto Zooprofilattico Sperimentale delle Venezie (IZSVe), Italy) and were listed in Commission Decision 2010/367/EC (5). 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).

# Results and Discussion

Of 2,781 samples selected for AI surveillance, 32 were not suitable for analysis, leaving 2,749 samples from 221 poultry flocks. Of these samples, 2,726 were negative, seven inconclusive, and 16 samples were positive (0.6 %). Ten of the screening-positive samples gave negative results when retested in duplicates. The remaining 13 seropositive or inconclusive samples were all negative when tested with the haemagglutination-inhibition (HI) test.

In conclusion, all flocks tested in the surveillance programme for influenza were negative for influenza A virus subtypes H5 and H7 antibodies. Table 1 shows the number of flocks and birds tested in 2021.

***Table 1**: Number of certified breeder flocks, commercial flocks, and birds tested in the surveillance programme for AI in poultry 2021.*

| Species | Certified breeder flocks | | Commercial flocks | | Total | |
|---|---|---|---|---|---|---|
| | Flocks | Birds | Flocks | Birds | Flocks | Birds |
| Chicken | 80 | 830 | 78 | 778 | 158 | 1 608 |
| Turkey | 5 | 50 | 47 | 540 | 52 | 590 |
| Duck | 3 | 150 | 6 | 301 | 9 | 451 |
| Goose | 1 | 50 | 1 | 50 | 2 | 100 |
| **Sum** | **89** | **1 080** | **132** | **1 669** | **221** | **2 749** |

Besides the surveillance programme, additional samples taken for diagnostic purposes and for the control of imported animals were also screened for antibodies against influenza A virus or H5/H7. Results from these analyses are not included in this report. In November 2021, outbreaks of HPAI occurred for the first time in commercial poultry flocks in Norway. HPAI virus of the subtype A(H5N1) was detected by PCR from tracheal and cloacal swabs in two commercial layer flocks in Klepp municipality in Rogaland County.

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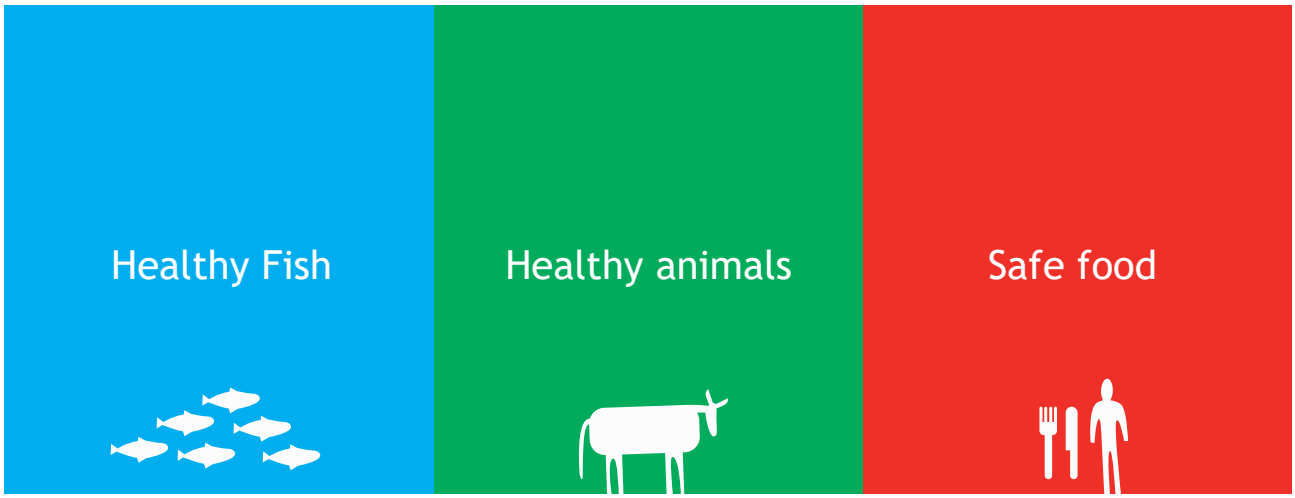


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