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FAQ

Research project: vaccination of birds kept in zoos against highly pathogenic avian influenza (H5N1) using a non-replicating viral vector

When will the birds be vaccinated?

The vaccination of wild bird species at Basel Zoo and Bern Animal Park is scheduled for late summer 2023.

How and when will you learn whether this vaccination is effective?

The serum from the vaccinated animals will be tested for neutralising anti-bodies against H5N1. These tests are very time-consuming because they have to be carried out in a biosafety level 3 laboratory. It is planned to publish the results approximately 2 years after the beginning of the study.

What is the current situation regarding avian influenza?

Thousands of cases of avian influenza have been detected in wild birds in Europe over the past two years. In previous years, outbreaks of highly pathogenic avian influenza were largely restricted to spring and autumn, when migratory birds made stopovers in our country on their journey northwards or southwards. However, an increasing number of outbreaks are now also being reported in the summer. This has given rise to concerns that H5N1 will become endemic – i.e. present all year round – in Europe. The virus' properties have also changed over time: It can now infect more bird species, causing severe and frequently fatal disease.

In 2022, H5N1 claimed the lives of a Dalmatian pelican and two wild grey herons at Bern Animal Park. In response to this outbreak, the Animal Park confined and quarantined all its birds for several weeks to protect them against the highly infectious disease. During confinement, it was found that many bird species cannot be housed for a prolonged time in accordance with animal welfare standards.

What is the specific aim of the project?

The aim of the project is to protect endangered wild bird species kept in zoos against lethal infection with highly pathogenic avian influenza viruses. Specifically, the plan is to immunise various susceptible bird species – such as Dalmatian or great white pelicans and flamingos – that live in open-air corrals or aviaries at the zoos of Bern and Basel using a non-replicating viral vector vaccine. The extent and duration of the post-vaccination immune response will be studied.

Why have birds not already been vaccinated against avian influenza?

As yet, universal vaccination against avian influenza is banned in Switzerland. One reason for this is that animals vaccinated using conventional vaccines cannot be distinguished from infected animals simply by means of serological testing. Countries that vaccinate against avian influenza would not be classified as specifically disease-free and may have to accept trade restrictions. In the EU, thanks to a new scheme, vaccination is now possible under certain conditions. In the decision to vaccinate or not the costs and the required logistics to carry out a large vaccination campaign, including the subsequently required monitoring, are not to be neglected.

Have any zoos already vaccinated birds?

In the past, the European Commission issued a special exemption permitting vaccination of zoo animals against highly pathogenic avian influenza, in response to which several European zoos and animal parks immunised various species of bird using inactivated vaccines.

What are the properties of the vaccine developed by the IVI?

The vector vaccine to be used in this release trial is based on a non-replicating vesicular stomatitis virus (VSV) from which one essential gene has been removed and replaced by an influenza antigen. The vector vaccine can only be propagated on certain helper cells, and since vaccinated birds do not produce infectious virus, they cannot transmit the viral vector. The vaccine has already been tested in chickens at the IVI in Mittelhäusern, and has demonstrated exceptional protective efficacy. The vaccine not only provides complete protection against highly pathogenic H5N1 virus, it also prevents vaccinated animals from shedding of H5N1. Finally, the viral vector vaccine allows serological differentiation between vaccinated and virus-infected animals.

Has this viral vector vaccine technology already been used?

A vaccine based on recombinant VSV vectors has been developed for Ebola haemorrhagic fever and officially approved for use in humans.

Could this vaccine ultimately also be used in commercial poultry?

In principle, yes. However, the ban on vaccination in Switzerland would need to be lifted first.

Further information

[Current international situation + Radar Bulletin](#) (FSVO)

[Avian influenza \(AI\)](#) (German Federal Research Institute for Animal Health)