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AVIAN INFLUENZA AND THE ROLE OF AEWA

INTRODUCTION

Over the last few months the Secretariat has received several messages regarding Avian Influenza (AI) and the role that migratory waterbirds might play in spreading this disease. So far only Wetlands International has been approached to provide relevant data on migratory waterbirds to the World Health Organisation (WHO).

From the information received so far the Agreement Secretariat has compiled the attached background paper. This paper clarifies the situation regarding the AI epidemic currently occurring in Asia.

DISCUSSION POINTS

This is not the first time and will certainly not be the last that migratory birds are seen as vectors spreading diseases such as AI.

The questions are:

- Should AEWA play a role in combatting the spread of this kind of diseases?
- If so, what could AEWA do?
- Who else should be involved?

From the experience over the last few years it might be expected that increasingly frequent outbreaks of disease might take place. A discussion by the TC on the questions raised above seems to be appropriate.

BACKGROUND INFORMATION ON AVIAN INFLUENZA.

The virus
Avian Influenza (AI) viruses belong to the group of type A influenzas. The viruses are named after two types of antigens that are part of the outer virus capsule, i.e. H (*Haemagglutinan*) and N (*Neuraminidase*) For example H5N1, the virus that caused the Asian epidemic this year. 15H and 9N antigens have been identified in all of the known type A influenzas. Different combinations of the two antigens appear more frequently in some groups of birds than in others. In waterfowl H6 and H3 are the predominant subtypes, whereas in shorebirds the predominant subtypes are H9 and H13. Highly virulent strains for chickens and turkeys are H5 and H7.

Risk of mutation
The AI viruses belong to the family of RNA viruses. RNA viruses easily swap genetic material with other viruses. Also mistakes during transcription occur frequently and lead to a high mutation rate, which may cause "antigenic shifts". An "antigenic shift" means that an exchange of genetic material has lead to alterations in the antigens that are exposed on the outer layer of the virus. These antigens might be new to the infected animal so that its immune system does not hold the right antibodies at hand. They have to be newly produced, but in very severe cases this is not happening fast enough.

Recent research has shown that viruses of low pathogenity can mutate into highly pathogenic viruses, sometimes after circulating for only a short period in a poultry population.

Because of the exchange of genetic material there is an imminent risk that the virus might break the species boundary and infect humans. So far no human-to-human transmission is known, but poultry-to-human transmission has been reported in Southeast Asia and the Netherlands.

Transmission through migratory birds
AI viruses are highly contagious. They have been found in many bird species, but predominantly occur in migratory waterbirds, especially wild ducks. As migratory waterbirds seem to be a natural reservoir for AI, they are also the most resistant to infections. Domestic chickens and turkeys on the other hand are very susceptible to epidemics of highly virulent AI.

The viruses persist in wild birds through faecal-oral routes of transmission. They can remain infective for up to a month at 4 degrees Celsius, for up to 10 days at room temperature and up to 3 days in dried droppings.

The disease is believed to pass from migratory waterfowl to domestic poultry through direct or indirect contact, for example contamination of water supplies with droppings from wild birds. Rodents, flies or other species moving between farms can also carry the virus from farm to farm.

The possible transmission of the AI virus by migratory birds has lead to accusations that these birds are spreading the disease.

Evidence against the theory that migratory birds brought the AI disease to Asia is provided by the Department of Microbiology at Hong Kong University and the Hong Kong Government. Since the first H5N1 outbreak in 1997, wintering birds have been tested each winter for H5N1. A total of 7000 samples have been tested and all of these have so far have been negative.

Transmission through trade
The presence of numerous virus types highly virulent for poultry points to a supportive environment for disease agents to move in the poultry sector. Large poultry farms where chickens are kept together under inadequate sanitary conditions and the growth of the poultry market in general encourage the spread of AI viruses. Live bird markets appear to play a major role in the spread of epidemics between farms. In these markets not only poultry but also wild birds are traded, and these may also carry the virus. This would indicate a second mode of transmission involving wild birds. Other possible modes of infection related to

human activities are the transport of contaminated equipment, feed and cages, and transmission by vehicles or on clothing. This suggests that stringent sanitary measures on farms can confer some degree of protection.

Concerning this year's epidemic in Asia, several experts have stated that direct contamination from migratory birds onto domestic chickens is unlikely, because wild ducks do not normally approach human settlements. The transmission of H5N1 over long distances is also not very likely, because this particular virus also causes disease in wild ducks, which are then unable to fly long distances.

Some views of experts
Yutaka Kanai, senior researcher at the Wild Bird Society of Japan: *" Ducks are aquatic birds. It is highly improbable that they would approach a chicken farm unless there is a suitable watering place nearby, (…). Besides, wild ducks are highly suspicious creatures. I can't see them entering a chicken farm looking for food*."

Dr Carol Cordona, poultry extension veterinarian at the University of California says, *"This particular variant is unusual both for the fact that it can infect humans, but also because it can make wild birds, especially ducks, sick*", and *"In my experience sick and dead ducks don't fly far. But people can very easily move sick birds over many miles. The movements may be legal or illegal, but in an outbreak of disease, they usually happen. I don't think migratory birds can be eliminated as major spreaders, but you can never underestimate the ability of humans to move disease."*

The WHO epidemiologist Richard Brown is sceptical about the idea that migratory birds brought the virus into Asia: *"If it was the chief cause* (of the outbreak) *you would have seen this happen before"*

Possible risks for migratory waterfowl
The fact that migratory waterbirds are the natural reservoir for AI makes them an easy target for measures aimed at stopping the spread of the virus. This might lead to disturbances and killing of migratory waterbirds. This should be avoided by all means.

How to protect migratory birds and domestic poultry
Newspapers and news programmes should state clearly that migratory waterbirds do not impose an imminent risk of infecting poultry. Nonetheless, precautionary measures should be taken.

The FAO says: *"Eliminating wild birds is not an appropriate measure to control the spread of the avian influenza virus. Killing wild birds will not help to prevent future bird flu outbreaks"*, and recommends: *"Prevention needs to be based on a control and surveillance system to ensure that any contact between wild birds and poultry is avoided or at least monitored. For example, commercial poultry owners need to ensure that poultry pens and poultry drinking water supplies cannot be contaminated by migrating birds".*

The FAO calls upon bird owners to be vigilant. Owners of backyard poultry or free-range poultry should be extra cautious. Bird owners should:

- erect pens to keep domesticated poultry away from wild birds;
- keep domestic waterfowl separate from poultry where the waterfowl have access to the same water as wild waterbirds;
- be alert to the signs of avian influenza in birds and quickly report any suspicions to the veterinary authorities.

References
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