

Avian Influenza in Pigeons

Rudi Hendrikx, DVM

Belgium

Due to the recent outbreak of Avian Influenza (AI) in Belgium and its disastrous consequences for the poultry-breeding industry, very strict prevention measures were taken. Because pigeons too legally belong to this category, these severe measures apply to them as well. However, without criticizing the responsible authorities since it is not an easy problem to solve, these strict rules are not reasonable for homing pigeons. It is the first time that Belgium is confronted with an AI outbreak like this. In the twenties there were outbreaks of classical fowl plague worldwide. Since that time there were no more large scale economical losses due to the outbreak of classical fowl plague, with the exception of an outbreak in the early eighties in the USA (Pennsylvania 1983) and in Ireland in 1984 (reference course for industrial poultry diseases by Professor Dr R Ducatelle). There was another outbreak in the USA in 1993. This however does not keep us from learning from the American situations and draw the necessary conclusions from them. In the introduction, AI is briefly explained. This is necessary to comprehend the rest of the file.

Introduction:

The avian influenza virus belongs to the family of the orthomyxoviridae. This name contains the word myxa = mucus. These viruses mainly target mucoproteins in the mucosa of the bronchial tubes. This family consists of the influenza viruses. There is only one genus: the Genus Influenzavirus. This family is subdivided in three sero-types; A, B and C. Influenza A viruses infect humans, horses, pigs and fowl (ducks, chicken, turkeys, guinea fowl and several other wild birds). It is the Influenza A virus that causes avian influenza with chickens. Interspecies transfer of the virus from humans to pigs frequently occurs, the

opposite is less frequent (virology, Professor Dr Pensaert, State University of Ghent, Belgium). Especially influenza with waterfowl is of important epidemiological meaning. Wild ducks are believed to be particularly important virus reservoirs. In the pathogenesis, humans could be an important passive carrier in the spread of the virus (by means of contaminated clothing or shoes). Animals infect each other via airborne contact or via their excreta (feces). Infection is systematic and the virus is usually spread through respiratory secretions (industrial poultry diseases by Professor Dr R Ducatelle). The most obvious symptoms in a clinical outbreak are respiratory or nervous system diseases and a high mortality rate. Furthermore, a drop in egg production may occur. The virus can be diagnosed in several ways:

- First of all there will be the autopsy, because the virus causes injuries like pinpoint hemorrhages in the bronchial tubes, stomach and intestines.
- Secondly, there is an ELISA (Enzyme Linked Immuno Sorbent Assay) test, virus isolation using a swab is possible, or an immunofluorescent test can be carried out. Serological diagnosis through blood samples and the determination of antibody titre are also possibilities. In this last test at least two blood samples should be used (industrial poultry diseases by Prof Dr R Ducatelle, State University of Ghent, Belgium).

Are pigeons susceptible to AI?

A lot of scientific research has been carried out to test the susceptibility of pigeons to

A.I. (Panigraphy, Senne Pedersen; Shafer Pearson, May 1995). The outcome of this research in literal translation: The research indicated that pigeons inoculated with both the highly pathogenic, as well as the low pathogenic strain of the avian influenza virus through the eyes, nose and straight into the blood stream stayed healthy, did not shed virus nor did they develop a detectable antibody titre to AI. It was therefore decided that pigeons under the research conditions are RESISTANT to an infection with avian influenza. This study is not the only one. Pathogenicity of highly pathogenic avian influenza strain H5N1 of Hong Kong origin was also tested on pigeons by Perkins and Swayne in January 2002. Here, too, the conclusion was that pigeons were non-susceptible, even to this highly pathogenic strain. It is important to mention that researchers also tried to infect pigeons, with the highly pathogenic H5N2 influenza virus that caused major problems in Pennsylvania, but without results (M Burgh M A, C W Breard USDA, Athens, Georgia). Furthermore, blood samples of as many as 160 pigeons from the quarantine zone were taken during the '93 outbreak in the U.S.A. None of them tested positive. Even in 1968, Wilson and Lange already did some experiments to try to infect pigeons with the AI virus, however also without success. In 1969, Narayan et al (Canada) tested pigeons. He too tried to infect pigeons with the virus without result.

Are pigeons spreading the AI virus?

To verify whether free flying pigeons could possibly play a role in the spread of the virus, it is important to check the possible ways of transmission:

1. Pigeons have the disease and spread it: As explained above and proved by numerous scientific studies, pigeons are non-susceptible to the virus and so they cannot spread it in such a way.
2. Pigeons are carriers and secrete the virus without being ill, and they spread the virus in

such a way: In the study 'Susceptibility of pigeons to avian influenza' it has been clearly proven that pigeons, which were contaminated with as much as 100,000

viruses without causing disease, did not produce the virus. This was tested 7, 14 and 21 days after the inoculation. Pigeons therefore do not secrete the virus and cannot spread the disease in this manner. Narayan in Canada carried out a very interesting study in 1969. Pigeons were infected with the virus through the blood and the nose and then placed in lofts together with turkeys. Not only the pigeons stayed healthy but also the turkeys did not show any symptom of the disease. There clearly was no transmission from the pigeons to the turkeys.

3. Pigeons acting as a vector in the outbreak: When we look at the possible vectors in the outbreak of influenza viruses, there are a number of possibilities. Humans, vermin (flies, mosquitos), air, vehicles, birds (including pigeons), etc. As described above already, humans are considered to be the largest vector (through contaminated hands and shoes) in the spread of influenza (Professor Ducatelle, industrial poultry diseases).

The research on the role of wild birds and rodents in the spread of the AI virus has been of great value. This study was carried out in Pennsylvania, New Jersey, Maryland and Virginia, where as much as 4,132 birds and rodents from the buffer zone were caught and tested for the virus. Among these were 473 pigeons. None of the tested animals proved to be

infected by the virus. These are convincing figures.

A similar study was done in Virginia, where 313 birds from the immediate vicinity of contaminated companies were caught and tested. Here, too, 50 pigeons were among the tested birds and all of them tested negative. The same trend can be seen in the results of a test that was done in the USA in 1993, where 160 pigeons from a buffer zone were all negative. Referring to the above-mentioned test by Narayan of Canada, who inoculated pigeons with the virus and put them in the same room with turkeys, it can be concluded that these pigeons must have certainly been a vector and nevertheless none of the turkeys became ill! I think it is obvious that it has been proved by all these tests that the role of pigeons as a vector in the spread of the AI virus is very little, if not non-existing!

Conclusion:

When we look at all these studies and evaluate them thoroughly, it is obvious that pigeons play no significant role in the avian influenza disease or even in the spread of it. It is therefore morally and scientifically unjustified to impose such heavy sanctions on this sector. As far as avian influenza is concerned, pigeons clearly do not belong to the poultry category and all these restrictions are absolutely useless.

To me, it seems obvious that following the American example pigeons should be taken out of this category and freed from the restrictions. I would like to inform you of the situation and warn you for the fact that this problem could occur in your country tomorrow. It is therefore important that your pigeon organizations discuss these problems with the government now in order to be prepared for the future.