

## A COMPARATIVE RISK CONSEQUENCES ASSESSMENT FOR AVIAN INFLUENZA OUTBREAKS OCCURRED IN ROMANIA

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### Summary

Avian influenza is nowadays, an animal disease which has major implications for the public health and considerable direct and indirect social effects. It generates major losses in the poultry industry, plus significant collateral economic losses, for the time being.

The Service of Policies, Strategies, Programmes and Sanitary Veterinary Procedures within the National Sanitary Veterinary and Food Safety Authority together with the Projection, Development, Coordination and Research Service within the Institute for Diagnosis and Animal Health, performed a risk analysis concerning the wild bird risk for Romania, related to the avian influenza, in order to facilitate a early reaction of the sanitary veterinary and food safety services and of those for public health.

A first stage of avian influenza risk identification was issued related to the wild birds, especially to the migratory ones. The risk origin, the risk itinerary, the risk intermediate zones, the emission risk (concerning the introduction of the avian influenza into Romania), the exposure risk (of the wild and domestic birds to the avian influenza virus), and the transmission risk (in Romania and later for migration) were underlined here.

The identified risk was evaluated then after the place and dimensions of wild birds migrations and assessed upon the import critical unit values for the avian influenza.

This work aims at explaining last part of the risk identification — evaluation of risk consequences for the avian influenza outbreaks occurred in Romania in the three diseases waves identified during October 2005 - July 2006.

**Key words:** avian influenza, risk analysis, risk identification, consequences of risk

Romania was the first European and the most affected country by the avian influenza during the time 2005 – 2006.

A time assessment of the influenza outbreaks occurred in Romania points out that it developed in three waves, the first were correlated, while the third had apparently no connection with the first two.

The first wave of avian influenza lasted in October – December 2005 and consisted of 24 outbreaks in two counties in Eastern Romania, comprising the Danube Delta (Tulcea County) and the associated lakes to it and to Black Sea shore.

The second wave, with 30 outbreaks, was located in seven counties, around the first wave second counties. It had direct epidemiological correlation with the first wave outbreaks, but developed in January – March 2006.

The third wave had 132 outbreaks was spread over 19 counties, in May – June 2006 and, other that those affected by the two first bird flu waves, except two counties.

### **Materials and Methods**

A comparative evaluation of the global and specific risk was elaborated for the three avian influenza waves in Romania. It was selected the Carvallo-Merkhofer estimation approach on the risk analysis structure, where the estimation of the risk consequences is a stage of the first domain of the risk analysis, with regard to the transmissible animal diseases.

A comparative estimation of avian influenza risk consequences, with respect to migratory birds was set up taking into account the direct sanitary veterinary effects of the disease, expressed mainly by the morbidity and mortality indices, as well as by the records of the disease indirect effects through veterinary expenses, intensive surveillance measures for prevention and control over the disease in the outbreak proper and avoiding dissemination of the diseases from the outbreaks into the territory.

The comparative estimation of avian influenza risk was performed globally, on the one hand, having in view both wild and domestic birds, and also specifically, with regard to certain birds types and species involved. Avian influenza risk consequences was focused to the impact of diseases collateral effects, i.e. upon the poultry sector, agriculture, poultry trade, hatching eggs trade, eggs for consumption and egg products or egg based products, upon tourism and last, but not least, upon the public health safety.

A qualitative estimation of avian risk consequences for Romania was then followed by the quantitative risk (quantified) estimation expressed in expenses or financial losses. The processed data are those obtained from the technical and financial records, related to the veterinary domain, further from the official addresses held by the employers' unions, in the poultry industry, official data from the local and central public administrations, involved municipalities and ministries.

### **Results**

We identified at least six domains or major economic branches which were affected by the avian influenza: economical, trade, social, financial, cultural and public health.

Related to direct damages by morbidity and mortality, pursuant to data given by the international organisms in the field, during 1999 – 2001, when Italy was faced to the H<sub>7</sub>N<sub>1</sub> virus of the avian influenza, approximately 13 million poultry

were killed or died. Around 17 million birds were killed, when the direct expenses thereto amounted to 62 million dollars, in the United States of America, after the incidence, in 1983, of the avian influenza caused in Pennsylvania by the H<sub>5</sub>N<sub>2</sub> virus, during the two years that lasted the disease.

Local authorities destroyed about one fourth of the domestic birds (about 30 million) during the epidemics with the H<sub>7</sub>N<sub>7</sub> virus that struck Netherlands, in 2003. In Belgium some 2.7 million were killed, and in Germany – 400.000 poultry. The Netherlands lost 150 million Euros during the episode of 2003.

In Romania, a number of 800,000 poultry were killed in the affected farms during the third wave, while in the householding yards 300,000 were killed, so reported by the Ministry of Agriculture, Forests and Rural Development.

Losses by death in wild birds, mainly in the Danube Delta were considerable. It was evaluated that approximately 150.000 birds of the sensitive species died, during the first avian influenza wave. Surprisingly some species that were not considered as being very receptive to avian influenza virus: wild pigeon, heron, bald coot, brown head duck, red neck goose were also affected by the virus. Greatest surprise, however, was the high mortality percentage registered in swans, confirmed by micro-outbreaks identified also in Europe. We now submit as being suggestive the losses registered by the Danube Delta Biosphere Reservation.

Summer swans and wild small hens dead in one month after the first case of avian influenza reported:

- 15-21.10.2005: 178 summer swans dead in the piscicultural arrangements Maliuc, Obretinul Mare and Popina, the lakes Obretinul Mic and Babina, canal Lopatna and casily flooded zone and top of the bank ridge Caraorman;
- 25.10.2005: 12 summer swans dead on the lake Obretinul Mic, 1 swan in the zone strict protégée Saraturi-Murighiol-Popina and 1 swan on the lake Ciulinet;
- 27.10.2005: 16 summer swans dead in the zone piscicultural arrangements Maliuc;
- 31.10.2005: 11 summer swans dead on the lake Taranova;
- 2.11.2005: 8 summer swans dead, from wich 5 juvenile, on the lake Obretinul Mic;
- 4.11.2005: 4 summer swans dead in the Gulph Musura;
- 7.11.2005: 12 summer swans dead, from which 6 juvenile, in the lake Obretinul Mic;
- 8.11.2005: 20 summer swans dead in the Gulph Musura;
- 9.11.2005: 3 summer swans dead on the lake Fortuna;
- 10.11.2005: 6 summer swans dead and one small hens on the lake Obretinul Mic;
- 11.11.2005: 23 summer swans dead, from which 17 juvenile, on the lake Taranova;

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- 13.11.2005: 2 summer swans dead on the lake Fortuna and other 2 on the lake Balcanesti;
- 15.11.2005: 6 summer swans dead in the Gulph Musura;
- 16.11.2005: 7 summer swans dead on the lake Obretinul Mic, other 2 in the Gulph Musura and 9 in the canal of infiltration between maritime mile 14 – maritime mile 15, on the canal Sulina
- 23.11.2005: 6 summer swans dead (from which 5 juvenile) on the lake Capcicova;
- 25.11.2005: 16 summer swans dead on the lakes Obretinul Mic and Capcicova.

Trading consequences were strikingly resented in the field of business, domestic markets, sales of poultry and poultry products, destruction of consumers' confidence, caused by the drastic reduction of poultry, egg and poultry products consumption due to the restriction imposed on both inland and export market.

It was estimated that the effect of the bird flu led to a decrease of 85 % on the poultry sales that caused a 60 % loss for the poultry farmers and operators on poultry products.

The total losses due to closing animal markets and fairs (determined by the sanitary veterinary and food safety authorities and by the local administration authorities) and to the restrictions on the movement of certain species of animals, were estimated at 40 – 50 million euros.

Losses generated by the export bans imposed to Romania by the European Commission and the Member States, and also by third countries, with which Romania had economic relationship in the poultry domain, were assessed as being 13 million euros, only for the first wave, during October – December 2005, in the two counties. It is estimates that the total losses for the three waves were 62 million euros in this domain only.

Social problems were induced by applying the stamping-out procedure for the first time on such a large scale in Romania, in the affected areas, by an emotional effect and, especially because the killed poultry, was virtually the sole (and main) meat source for the population in the harmed zones. More that, the quarantine rules imposed on the outbreaks spots and around them, sometimes even for humans, the trouble for agricultural and other activities in the countryside, led to a hostile behaviour against local and central authorities, towards vets and law enforcement organs that applied the veterinary measures and restrictions. Romania's Government spent 5 million euros for helping population pass over this profound crisis, to supply them food and health protection means.

The losses in the poultry sector were tremendous. Data furnished by the poultry sector employers outline that the damages due to non population in accordance with the technologic flow with 3.07 million chicken amount to 288.3 billion old Romanian lei, i.e. 8,479,411.76 euros. Losses due to the delays put on chicken cutting caused, by the imposed restrictions, amount to 12.3 billion old

Romanian lei, i.e. 361,764.70 euros. Further, losses caused by export ban are 170.2 billion old Romanian lei – 5,005,882.35 euros.

Moreover, losses due to poultry meat price diminishing at slaughterhouse door — 504.1 billion old Romanian lei, which equal 4,826,470.60 euros. Besides we can mention, losses due to non using the hatching eggs, that mean 9.6 billion old Romanian lei, equivalent to 282,352.90 euros, additional costs by stocking the banned meat – 226.8 billion old Romanian lei, i.e. 6,670,588.20 euros, additional costs with disinfection – 24.1 billion old Romanian lei, 708,823.50 euros, where the overall losses were in the sector 1,235.4 billion old Romanian lei, i.e. 363,352,940.10 euros.

Increase of the poultry meat consumption in 2005 by 152% for the first nine months, until outbreaks of the avian influenza, resulted in an increase of 512 % of poultry meat import, especially for the last two months of the year.

Financial implications consisted mainly in expenses involving application of sanitary-veterinary measures, financial compensations granted to the affected people and losses in the banking sector.

In order to apply veterinary restriction measures, the Government of Romania spent 23 million euros in the first disease wave only. The compensations for having killed the poultry amounted to 4 million euros. Disinfection operations meant 40 million euros expenses dedicated to the Ministry of Transports.

Bank sector losses were assessed to about 100 million euros due to the inability of the poultry sector to return credits entered into, necessary for its running.

Economic consequences of the bird flu during the time October 2005 – end of July 2006, were estimated at 120 million euros. Hunting sector was affected by approximately one million euros due to the interdiction on it. Tourism, especially the Danube Delta one, was affected with 10 million euros, while the number of tourists decreased by 90 %, compared to contracts concluded.

Cultural and traditional activities were prohibited in the affected areas and surroundings. The efforts to protect public health related to the avian influenza have cost 17 million euros plus 2 million euros to ensure 5 million antifu vaccine doses.

### **Conclusions**

1. The evolution of the avian influenza in Romania resulted in huge losses and extra expenses.
2. A number of at least six economic sectors directly and severely affected by the disease were identified.
3. The avian influenza generated a deep crisis in the poultry sector.
4. The considerable costs induced by the disease evolution mean a support to strengthen the surveillance capacity and rapid and early reaction of the sanitary veterinary authorities.

5. The necessity to implement a national wide management of crisis situations, with introduction of adequate structures in the sanitary veterinary was underlined.

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