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AVIAN INFLUENZA IN ITALY – EXPERIENCES IN MANAGEMENT OF MULTIPLE INTRODUCTIONS

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Since 1997 Italy has been affected by seven epidemic waves of avian influenza caused by viruses of the H5 or H7 subtypes. These epidemics were caused by H5N2 HPAI, H7N1 (HPAI and LPAI), H7N3 (LPAI) [1] and, very recently, by H5N2 LPAI.

The most severe episode was observed during 1999-2001, in which Italy was affected by four epidemic waves of avian influenza (AI). The first epidemic wave was caused by a low pathogenicity avian influenza (LPAI) virus of the H7N1 subtype that subsequently mutated into a highly pathogenic avian influenza (HPAI) virus. Following the eradication of the HPAI virus, that caused death or culling of millions birds on infected and at risk farms, the H7N1 LPAI virus re-emerged twice in the same densely populated poultry area (DPPA) of the Po Valley.

Following the eradication of the H7N1 virus, a LPAI H7N3 virus was introduced in the industrial poultry population of Northern Italy. The H7N3 LPAI strain rapidly spread among poultry flocks located in the DPPA which had been affected by the H7N1 epidemic in 1999-2001. From October 2002 to October 2003 the virus was able to infect a total of 388 poultry holdings. About one year after the elimination of the last H7N3 affected poultry flock the virus re-emerged in the same area and the last affected farm was depopulated in December 2004.

The re-emergence or the introduction of AI viruses in the same DPPA resulted in the implementation of an emergency vaccination programme based on the "DIVA" (Differentiating Infected from Vaccinated Animals) strategy. By enabling the detection of field exposure in vaccinated animals the application of this system, in conjunction to a monitoring programme and a well defined territorial strategy has resulted in the eradication of H7N1 and H7N3 epidemics which occurred between 2000 and 2004.

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Field and laboratory evidence indicate that vaccinated animals are more resistant to challenge and shed lower amounts of virus [2,3], thus vaccination can be applied both as a tool for control and for prevention limiting the impact of AI infections.

Taking into account the high risk of AI virus introduction and spread in the identified DPPA, since October 2004 a bivalent H5/H7 pilot prophylactic vaccination programme has been implemented in a limited geographical area with the highest poultry population densities. The rationale behind the use of prophylactic vaccination is that it should be able to generate a minimal level of protective immunity in the population at risk. The immune response may be boosted if there is evidence of the introduction of a field virus .

In conclusion, Italy has been challenged with several subsequent epidemics of AI and has developed and applied a vaccination programme which has resulted in eradication of infection and given the high risk of re-introduction from the wild bird reservoir, is currently being used for the first time ever as a prevention tool.

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