NEW STRATEGIES FOR THE CONTROL OF "NOTIFIABLE" AVIAN INFLUENZA

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Avian Influenza (AI) is an infection of birds by influenza A viruses of the family Orthomyxoviridae. Many species of birds have been shown to be susceptible to this infection. Whereas wild aquatic birds form a major reservoir of low pathogenic (LP) viruses, infection of domestic poultry by AI viruses may be asymptomatic or produces clinical signs. In this case, they range from mildly pathogenic infection to systemic disease with near 100 % mortality (referred to as highly pathogenic : HP). In a very recent past, HP AI caused the loss of 50 millions poultry in the Netherlands/Belgium (in 2003) and more than 100 millions poultry died or were culled in South Asia (in early 2004 without taking into account the new losses officially notified since this summer). Although 16 haemagglutinin (H1-16) and 10 neuraminidase (N1-10) molecular species are known at present, to date, HP AI has been associated only with the H5 and H7 AI viruses (with two exceptions). In fact, although most H5/H7 AI viruses are LP they can easily mutate to HP. Beside the economical consequences mentioned above, on rare occasions H5/H7 viruses have displayed zoonotic properties and (altogether) have been involved in the death of at least 30 persons. Therefore, to take into account the future OIE AI definition (still to be discussed), we will presently refer to notifiable AI (NAI), every infection with HP or H5/H7 AIV.

Thus targeted control strategies aim at avoiding introduction in poultry farms and further spread of H5/H7 viruses irrespective of their virulence. Taken the recent increasing number of epizootics in the world, new strategies of control are considered. The present communication will overview them.

At the international and national level risk assessment is more and more implemented to identify the main sources and ways of transmission and to put in place suitable measures. Reinforcement of the requirements for international trade is being discussed and a new concept such as compartmentation, that is based on a management approach, is also considered (3).

A regular surveillance of AI is achieved through compulsory targeted serological surveys in poultry at risk and virological surveys in wild bird species at risk (1). In addition, Member States can decide on complementary surveillance. For instance, France has also implemented a virological surveillance of the most at risk poultry holdings to be able to define the characteristics of the eventual viruses that may be isolated, such data being useful in case of prophylactic vaccination (see below).

At the same time, a revision of the Community policy measures to control AI is being undertaken (2) and tools based on veterinary, economic, social-ethical issues are being set up to assess the efficacy of control strategies.

Emergency vaccination -that could prove itself and reveals itself as much less expansive then culling- is restored to favour in Europe as a supplement to biosecurity measures to avoid NAI secondary spread from known cases. However its use is dependent on the authorization of the European Commission that will be limited in time and space and will be given only on the basis of a detail, well-argued protocol provided by the concerned member State (2). The present communication will emphasize the situations that can justify such an approach and list its limitations depending on the vaccine made available and its efficacy with respect to the prevention of infection. In fact, commercial available vaccines do not completely prevent infection with wild viruses and investigations (which our staff is contributing to) are carried on to improve their efficacy. The lessons to be made from previous experiences of field vaccination will examplify the proper conditions to be recommended with the actual vaccines. The minimal requirements are a well scheduled and controlled vaccination using a vaccine allowing differentiation of infected/vaccinated birds together with a serological/virological monitoring to assess the efficacy and eliminate every new infected flock immediately (not to lead to an endemic situation with a permanent virus circulation) favouring the selection of new viruses. Thus, it is essential that the veterinary Authority of the concerned Member State has the command of the whole operation. Under such conditions, the vaccination of birds can help to control the spread of the epizooty while avoiding mass culling of poultry (particularly when high poultry density areas are concerned) and protecting endangered, rare species (such as those kept in ornithological parks for instance) and high value poultry (such as the stocks obtained after genetic selection).

Even prophylactic vaccination to prevent primary introduction in poultry, is being considered in Community policy (2), although its modes are still to be discussed. In addition, the restraints imposed up to now to vaccinated poultry and their products with respect to international commercial exchanges should be released, under specified guarantees. However, the application of prophylactic vaccination will probably require the ability to ensure the best fitness between the vaccinal strain to be used and the characteristics of the AI strain likely to emerge, to prevent any infection of poultry. Our preliminary results show that, actually, it cannot be recommended in France to prevent the infection of poultry holdings at risk.

References

1) Commission of the European Community (CEC), decision SANCO/10221/2004-rev6 of approving the programmes for the implementation of Member States' surveys for avian influenza in poultry and wild birds during 2004..
2) CEC, proposal for a new council directive on Community measures to control AI (work documents, 2004)
3) OIE terrestrial code Avian Influenza chapter (new revision under study, working documents, 2004).