

Note

## Vaccination for avian influenza in Asia

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Continuing outbreaks of highly pathogenic avian influenza (HPAI) in a number of Asian countries, caused by an influenza type A virus of H5N1 subtype represent a serious risk for animal and public health worldwide. Although vaccination programmes have been recommended recently, there is field evidence that vaccination alone will not achieve eradication, and if not used appropriately it may result in the infection becoming endemic.

At the recent FAO summit meeting in Rome (3–4 February 2004), vaccination, using the differentiating infected from vaccinated animals (“DIVA”) strategy, was recommended when there is risk of major spread and depopulation is not feasible or desirable [1]. The main reasons for this recommendation are that in the current situation stamping out of infected animals may result in the removal of a major source of food for rural communities and damage the commercial viability of the local poultry industry.

Attempts at controlling AI infections of poultry with H5 and H7 subtype viruses by homologous and recombinant vaccines without monitoring field exposure and the application of stringent control measures on field exposed farms (regardless of the state of vaccination) have been unsuccessful in eradicating the infections in Mexico (H5N2) and Pakistan (H7N3) [2].

From experimental data it is known, for both low pathogenic avian influenza (LPAI) and HPAI, that vaccination protects against clinical signs and mortality, reduces virus shedding and increases resistance to infection [2,3]. However, the virus is still able to replicate in clinically healthy vaccinated birds and this is probably why vaccination alone has been unsuccessful in achieving eradication [2].

In 2000, a novel DIVA strategy that enables the differentiation of vaccinated/uninfected from vaccinated/infected animals was developed in Italy and remains to date the only successful field experience of this strategy. Between 2000 and 2003 its application successfully eradicated two epi-

demics of LPAI in Italy caused by viruses of H7N1 and H7N3 subtypes. This “DIVA” strategy utilised inactivated oil emulsion heterologous vaccine containing the same haemagglutinin (H) subtype as the field virus, but a different neuraminidase (N). Antibodies to the N of the field virus are natural markers of field exposure [4]. The “DIVA” strategy also represented a breakthrough in trade policy, since commercial restrictions on vaccinated poultry meat were lifted, provided the flocks could be demonstrated to be free of infection [5].

In Italy the “DIVA” strategy was successful in eradicating AI because it was coupled to a wider complex territorial strategy involving upgraded biosecurity, monitoring of vaccine efficacy and field exposure through appropriate laboratory testing, and appropriate management, i.e. stamping out or controlled marketing of infected flocks, regardless of vaccination status [6]. Financial compensation of farmers was a key part of this strategy.

In Asian countries where a similar infrastructure and philosophy exist a similar strategy is feasible, but some of the affected Asian countries do not appear to have a system that is organised to deal with a vaccination campaign in poultry aimed at the eradication of infection. As a result HPAI could become endemic in a vaccinated poultry populations in some Asian countries. To prevent this occurrence, effort must focus on upgrading and on the application of basic knowledge of strict biosecurity procedures necessary to implement a vaccination programme and to depopulate farms. The programme must be co-ordinated by a crisis unit to define the areas, protocols, monitoring and restocking programmes, the sanitary measures to be taken in case of infected flocks. It must include modern information technology and the support of an accredited laboratory. The possibility of recovering export status is technically feasible with the “DIVA” strategy, but requires the implementation of a stringent, reliable and transparent monitoring programme.

It is our opinion that if vaccination is used and not managed appropriately as part of a wider control strategy, eradication will not be reached and the concomitant public health threat will not be removed.

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