International Poultry Production

Poultryhealth BYTES

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Number: 206

Avian influenza XXIV

The ideal avian influenza vaccine

The ideal vaccine is one which gives the best protection. This means the vaccine and field viral types should be antigenically close, work when given as a single dose by a mass application method and be suitable for DIVA purposes (that is, carry some sort of antigenic marker so field and vaccinal blood titres can be differentiated). It should be able to overcome maternal antibodies and produce an effective immune response and possibly be administered at the hatchery. It should not be too expensive.

Basis of immunity

Avian influenza vaccines provide protection to poultry principally through humoral immunity against the haemagglutinin protein.

Assessing vaccine protection

The best way of assessing the protective immunity from avian influenza vaccines is by the use of LPAI or HPAI challenge models of the target poultry species. All such studies/challenge models should include a group of birds vaccinated with a placebo to show that a proper challenge with the challenge virus has occurred.

As challenge model testing is expensive another method is to measure the level of HA sub-type specific H1 antibodies, preferably after two vaccinations.

Criteria used for assessing protection can vary depending on whether the virus being protected against is HPAI or LPAI. For HPAI, protection against morbidity and mortality have been frequently used to measure protection. These yardsticks are no good for assessing LPAI vaccines because neither mortality nor specific serious clinical signs (morbidity) occur in LPAI.

For both LPAI and HPAI the prevention of infection or a qualitative or quantitative reduction of viral replication in the respiratory tract or digestive tract are protective criteria that can indirectly assess the role of vaccination in limiting environmental contamination and field virus spread.