International Poultry Production

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Avian influenza XXXV

Surveillance re vaccination

It is important to check whether vaccinated flocks have adequate immunity, whether it has declined to a level that warrants a booster dose, or if the flock has been infected by a field challenge.

Laboratory assays can be used to determine effective vaccination (percentage of the flock that has been properly vaccinated) and to ascertain an estimate of field protection (the percentage of the population protected against circulating field viruses).

The use of a homologous antigen to the vaccine in a serological test is an effective means of measuring the success of vaccination in chickens by the production of an immune response against the vaccine. The humoral immunity produced against the sub-type specific HA protein, as measured in HI or VN tests using the circulating field virus, provides a positive predictive measure of protection in an individual bird and, when assessed collectively, the protective immunity within a population, such as a flock.

When using a standardised serological test method, serological results can be compared with in vivo protection studies for determining minimal protective blood titers or determining the point at which a booster vaccination should be administered. However, this is not possible for all bird species because of variation in HI titers due to factors such as the procedure, species and breed of bird, the length of time post vaccination and type of vaccines and adjuvant used.

For example, when assessing inactivated vaccines in some chicken types challenged with H5 HPAI virus, prevention of mortality is associated with an HI antibody geometric mean titer (GMT) of ›8 or ›10 depending on author, yet the prevention of oropharyngeal replication and shedding of the avian influenza virus was seen in chickens with HI antibody GMT ›40 and complete prevention of oropharyngeal shedding was only seen in chickens with HIT antibody GMT ›128.