International Poultry Production

Poultryhealth BYTES

Your own reference source on poultry health

Number: 207

Avian influenza XXV

Vaccine types

Inactivated whole avian influenza vaccines

To date, the majority of avian influenza vaccines that are registered and used in the field are of this type. They are administered by subcutaneous or intramuscular injection. These vaccines have the advantage that they are killed vaccines are therefore totally safe to use in normal and immunocompromised birds. But the downside is that in order to induce immunity these vaccines need to deliver high quantities of antigen and their immunogenicity can be greatly enhanced by the inclusion of adjuvants.

With these vaccines, the route by which they are administeredand the timing of the dose(s) will impact on their immunogenicity and efficacy of response to them. Typically, this kind of vaccine is administered with other viral and bacterial vaccines of the same type.

Inactivated vaccines tend to use seed stock derived from LPAI, and occasionally HPAI, field isolates. Since about 2006 licensed vaccine strains have been used that incorporate H and N antigens from recent avian influenza field isolates by utilising reverse genetics technologies. Up until 2010 some 57% of inactivated vaccines used were of this type.

Adjuvants

Vaccine adjuvants are substances that enhance the immune response to poorly immunogenic vaccines. Currently, further research is being done in this field. Two areas are being focused on, namely oil adjuvants and liposomes.

Liposomes are vesicles of cholesterol and phospholipids, which can incorporate the desired antigen in the centre of the vesicle or within the cell membrane.

Liposomes can induce humoral immunity.

In vivo expressed haemagglutinin

In in vivo expression systems the immunogen is produced within the bird by the use of a live bacterial or viral vector. The advantage of this type of vaccine is that it can stimulate both humoral and cellular immunity. Live vaccines are usually superior to inactivated vaccines in inducing immunity and thus reduce viral shedding by the vaccinated bird.

However, there is a drawback in that they are susceptible to inhibition of vector replication if active or passive immunity to the vector is present.

In the next issue of Poultryhealth Bytes we will consider more aspects of live vaccination against avian influenza.