TECHNICAL SERVICES BULLETIN

INNOVAX®-ILT:

More Effective Protection than Vectormune® HVT-LT or Vectormune® FP-LT[1]

The poultry industry has widely adopted the use of recombinant vaccines for the control of infectious laryngotracheitis (ILT) to avoid spreading live ILT virus through the use of chicken embryo origin (CEO) vaccine. The ability of these vaccines to protect against virulent ILTV challenge depends upon the characteristics of the virus used as the vector, and the glycoproteins expressed by the inserted genes.

A study conducted at the University of Georgia College of Veterinary Medicine, Athens, GA, by Dr. Maricarmen García et al. investigated the relative efficacy of three recombinant ILT vaccines: Innovax-ILT (Merck Animal Health), Vectormune HVT-ILT (CEVA), and Vectormune FP-ILT (CEVA)[1].

Innovax-ILT and Vectormune HVT-LT each use a herpesvirus of turkeys (HVT) as the vector for the ILT genes, and Vectormune FP-ILT uses a fowlpox virus as the vector for the ILT genes. The ILT gene insertion in Innovax-ILT codes for glycoproteins I and D, while the ILT gene insertion in the Vectormune products codes for glycoprotein B.

The vaccines were administered to broiler chickens via in-ovo inoculation, at 18 days of embryonation, using the manufacturer's recommended dose. Protection was evaluated following challenge at 28 and 42 days of age (DOA) based upon clinical signs and virulent ILT virus DNA load detected in the trachea and conjunctiva.

Conclusions

- Innovax-ILT vaccinates had clinical sign scores and challenge virus DNA loads that were not significantly different than the non-challenged group: the birds were effectively protected at both the 28 and the 42-day challenge.
- The Vectormune HVT-ILT and Vectormune FP-ILT vaccinates had clinical sign scores and challenge virus DNA loads that were not significantly different than the challenged group: the birds were not effectively protected at the 28 and 42 day challenges.
- The rank from highest protection efficiency to lowest of the three commercial vaccines was: Innovax-ILT (highest), Vectormune HVT-LT and Vectormune FP-LT (lowest).
- Innovax-ILT is the vaccine of choice for maximum protection against virulent ILT challenge in broiler chickens.

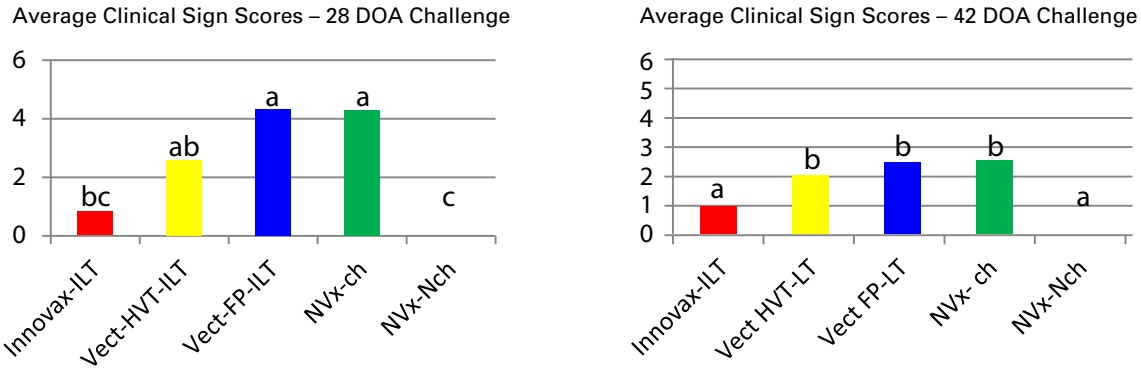
[1]Data on file

STUDY SUMMARY:

Embryonated Hubbard/Cobb broiler eggs were hand-inoculated with one of three vaccines: Innovax-ILT, Vectormune HVT-LT, or Vectormune FP-LT. Vectormune FP-LT was given in combination with CEVA HVT/SB1. Sham-inoculated controls (challenged and non-challenged) were used for comparison.

The birds were challenged with virulent ILT field strain 63140 at 28 days of age ($10^{3.5}$ $TCID_{50}$/ bird) or at 42 days of age ($10^{2.8}TCID_{50}$/ bird) via intratracheal and eye-drop inoculation. Clinical signs (depression, conjunctivitis and respiratory signs) and mortality were evaluated on days 3, 4 and 5 post-challenge, with cumulative scores and peak score calculated for individual birds, according to the scoring system of 0 (normal), 1 (mild), 2 (moderate), 3 (severe) or 9 (Mortality). . Average clinical sign scores collected at 5 days post-challenge are summarized in Figure 1 (28 –days of age challenge) and Figure 2 (42-days of age challenge).

Figures 1 and 2: Average Clinical sign scores of vaccinates 5 days post- challenge at 28 days or 42 DOA.



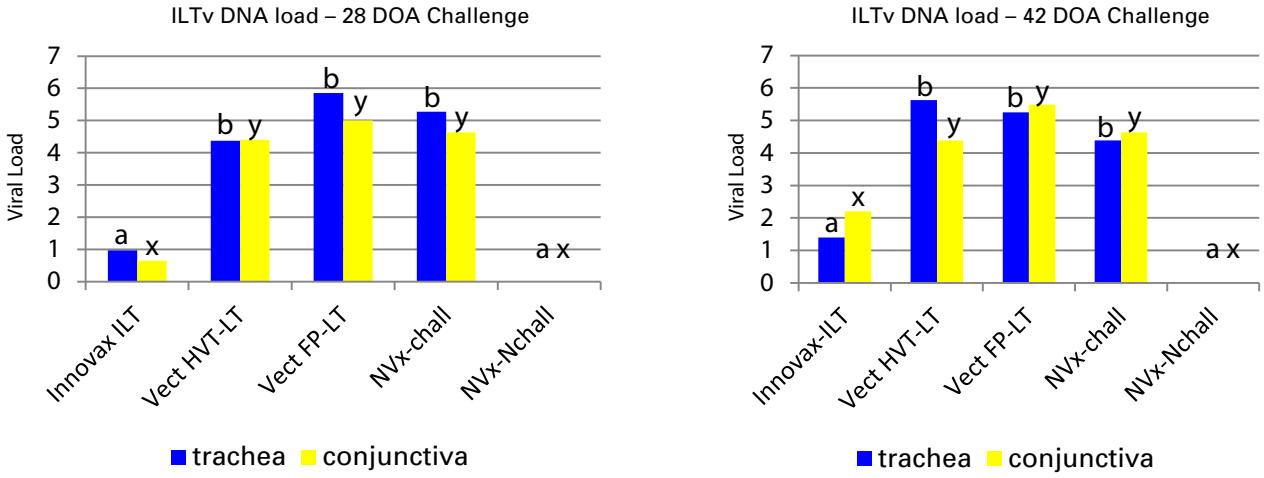
[a,b,c] Values without a common superscript differ significantly (P<0.05)

At 28 days of age, there was no significant difference between the Innovax-ILT average clinical sign score and that of the non-challenged control, whereas there was no significant difference between the Vectormune HVT-LT, the Vectormune FP-LT and the challenged control.

At 42 days of age, the overall clinical sign scores were lower, with Innovax-ILT significantly lower than either Vectormune HVT-LT or Vectormune FP-LT, and not significantly different from the non-challenged control group. The Vectormune groups were not significantly different from the challenged control group.

Quantitative real-time PCR in a duplex assay was used to determine the challenge virus DNA load in the trachea and conjunctiva at the peak of clinical signs (5 days post-challenge) for each challenge study. The results are summarized in Figure 3 (28-DOA challenge) and Figure 4 (42-DOA challenge).

Figures 3 and 4: Virulent ILTv DNA load ($Log_{10}2^{-\Delta\Delta C}$) in the Trachea and Conjunctiva following challenge at 28 and 42 days of age.



[a,b] Different superscripts indicate significant difference in DNA load in the trachea ($P<0.05$)

[x,y] Different superscripts indicate significant difference in DNA load in the conjunctiva ($P<0.05$)

The virulent ILT viral DNA load – both in the trachea and the conjunctiva-- was significantly lower in the Innovax-ILT vaccinates than either of the Vectormune groups. The Innovax-ILT vaccinates were not significantly different from the non-challenged control group, while the Vectormune HVT-LT and Vectormune FP-LT vaccinates were not significantly different from one another, nor from the challenged control group.

DISCUSSION

The goals of vaccination against ILT are to prevent or reduce the clinical signs and mortality associated with ILTv infection, and also to reduce the spread of the disease to additional premises. Innovax-ILT provided superior protection against clinical signs and significantly reduced the viral DNA load in the trachea and conjunctiva (the source of viral transmission).

Innovax-ILT is the recombinant vaccine of choice for the protection of broilers.

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