

Merck Animal Health

Maximizing Performance: rHVT Vaccine Technology Performance Comparison

Recombinant HVT vaccine technology is new to the US broiler industry. Due to interference between rHVT products, integrators must make choices about which diseases would be better to control using the new technology, and which are best to control with conventional live vaccination strategies.

A US integrator conducted a week-on, week-off field trial for eight weeks in late 2009. The integrator examined two vaccination programs to protect against Infectious Bursal Disease (IBD), Newcastle Disease (ND) and Massachusetts and Arkansas infectious bronchitis (IB):

Program A:

Live ND + Mass/Ark IB via spray cabinet + rHVT-IBD via in-ovo injection. TECHNICAL SERVICES BULLETIN INTERVET/SCHERING-006 PLOUGH ANIMAL HEALTH Maximizing Performance: rHVT Vaccine Technology Performance Comparison

Program B:

rHVT ND (Innovax-ND-SB vaccine) + live IBD (89/03) via in-ovo injection + live Mass/Ark IB via spray cabinet.

The integrator was not currently experiencing significant respiratory disease challenge. With the assumption that live respiratory vaccine reaction might adversely impact weight gains, the integrator monitored final weight, average daily gain and feed conversion ratio (FCR) as key comparison parameters.

Bursal health was also evaluated based on histology conducted on bursas taken from three farms from each program at the following ages (five birds per farm per age): day 7, day 14, day 21, day 28, day 35.

Conclusions

- Program B (Innovax-ND-SB + 89/03 live IBD vaccine) demonstrated better final weight and average daily gain compared to Program A (rHVTIBD + live respiratory vaccines).
- Program B also demonstrated healthy bursas through day 21 on all sampled farms and to day 35 on one farm. Bursal atrophy was found on all sampled farms by day 21 from Program A (rHVT-IBD).
- In this case, based on histological examination, the live IBD vaccine 89/03 provided better protection to young flocks than the rHVT-IBD.
- The rHVT vaccines will interfere with one another if used at the same time. It is important for the integrator to choose the proper combination of live vaccine and rHVT vaccines to provide the optimum protection



FIELD TRIAL

The integrator conducted trials in October / November 2009, placing Program A flocks one week, Program B flocks the following week and continuing with alternating weeks for eight total weeks.

Final weight, average daily gain and FCR was summarized for the placements each week.

Bursas were collected from 3 farms from each program at weekly intervals in age: days 7, 14, 21, 28 and 35. Histological examination was conducted by Dr. Fred Hoerr.

RESULTS:

1. PERFORMANCE SUMMARY

Table 1: Weight and FCR Performance Summary

Product	FCR	Weight	Wgt Gain/Day
Program A Live ND/ Mass/Ark + rHVT-IBD	1.965	6.048	0.1241
Program B Innovax® ND-SB + Mass/Ark 89/03	1.97	6.130	0.1243

The weight and feed conversion summary for the trial is found in Table 1.

- Weights and feed conversions were similar, although Program B had average daily gains >0.006 lb more than Program A in three of four compared weeks.

2. BURSAL HISTOLOGY

The bursas were scored according to the following score system:

- 1 = normal
- 2 = mild depletion / non-specific / vaccinal
- 2.5 = large follicle restitution (>5 large follicles)
- 3.0 = moderate small follicle restitution
- 3.5 = minimum small follicle restitution
- 4.0 = follicle LC necrosis or severe uniform lymphoid depletion

Table 2: Bursal Histopathology (1 = good, 4 = atrophy)

Age Days	IBD Vaccination Program							
	89/03	89/03	89/03	Average 89/03	rHVT	rHVT	rHVT	Average rHVT
7	1.6	1.0	1.0	1.2	1.6	1.0	1.0	1.2
14	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
21	1.2	1.0	1.0	1.1	4.0	2.8	3.6	3.5
28	x	2.1	3.7	2.9	3.6	3.1	3.2	3.3
35	1.2	2.6	3.0	2.6	3.2	3.0	3.0	3.1

Results of the two programs are summarized in Table 2.

All of the bursas examined were healthy at the day 7 and day 14 sampling (when maternal antibody protection is greatest). At day 21, the rHVT bursas demonstrated significant atrophy. At day 28, bursas from both groups demonstrated evidence of bursal damage, with higher scores in the rHVT group.

- 89/03 is a Delaware variant strain live IBD vaccine. This integrator has a predominately variant IBD challenge population. The live vaccine provided longer duration protection with milder bursal lesions than the rHVT vaccine in this field trial.

3. DISCUSSION

The field performance of the two programs in the absence of serious respiratory disease challenge was similar. Weights slightly favored the Program B (rHVT-ND / live IBD) flocks, while FCR was the same for both groups.

Six pound birds have a long compensatory gain period following initial vaccination reactions. In the absence of significant field disease challenge, the impact of longer bursal health on performance is unknown.

In this case, based on histological examination, the live IBD vaccine 89/03 provided better protection to young flocks than the rHVT-IBD.

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