

BTO2-REO VACCINES COMPARISON TRIAL

Purpose: To evaluate the potency of all fractions in an LAHI BTO2 - REO killed virus vaccine and compare them with the same fractions in BD-REO killed virus vaccines from Company B and Company C.

Procedure: Two week old SPF chickens from the same source and hatch were vaccinated with 0.2 ml subcutaneously in the neck with live S1133 strain of Reovirus (live virus prime). Three weeks later the birds were divided into 10 groups of 12 birds each and identified by wing bands. The birds in Groups 1 - 9 were fractionally vaccinated with one of the above vaccines as outlined in Table 1. The birds in Groups 10 and 11 remained as unvaccinated controls. At the time of vaccination the birds in Groups 1 - 10 were bled for the determination of post-prime Reovirus ELISA and VN serum antibody titers. At four weeks post-vaccination the birds in Groups 1 - 10 were bled for the determination of Reovirus and IBD ELISA and VN serum antibody titers. At this time, the birds in Groups 1 - 10 were also challenged by eye drop with the Delaware Variant E strain of IBDV (1.0×10^4 EID₅₀ per dose). The birds in Group 11 remained in isolation as non-challenged controls. At 6 days post-challenge (PC), all birds, including the non-challenged control group, were necropsied and their bursae examined grossly for typical IBD lesions and scored as positive or negative. In addition, each bird and its bursa was weighed and the bursa/body weight ratio calculated using the following formula:

$$\text{Bursa/body wt. ratio} = \text{Bursa wt.} \div \text{Body wt.} \times 1000.$$

Any bird with a bursal/body weight ratio greater or lower than the range set by adding 2 standard deviations to, and subtracting 2 standard deviations from the mean bursal/body weight ratio of the isolated control group (Group #11), was considered positive for IBD (Bursal/Body Weight Range Method).

Results:

Table 1. Delaware Variant E IBDV (DVE) Challenge Results

Group No.	Vaccine Used	Dose Given	# Positive/ # Total		Percent Protection		Mean Bursa/Body Wt Ratio \pm Std Dev
			Visual Score	*	Visual Score	*	
1	LAHI	1/10 th	0/11 ^a	3/11 ^{a b c d}	100	73	4.09 \pm 1.03 ^{1,2}
2	LAHI	1/50 th	1/11 ^{a b}	1/11 ^{a b}	91	91	4.01 \pm 0.79 ^{1,2}
3	LAHI	1/100 th	1/11 ^{a b}	1/11 ^{a b}	91	91	4.22 \pm 1.01 ^{1,2}
4	Co. B	1/10 th	4/11 ^b	6/11 ^{c d e}	64	45	3.33 \pm 1.05 ^{2,3}
5	Co. B	1/50 th	10/12 ^c	10/12 ^{e f}	17	17	2.28 \pm 1.22 ^{3,4}
6	Co. B	1/100 th	11/11 ^c	10/11 ^{e f}	0	9	1.78 \pm 0.77 ⁴
7	Co. C	1/10 th	0/12 ^a	3/12 ^{a b c}	100	67	3.88 \pm 0.79 ^{1,2}
8	Co. C	1/50 th	1/12 ^{a b}	3/12 ^{a b c}	92	75	4.07 \pm 1.26 ^{1,2}
9	Co. C	1/100 th	2/11 ^{a b}	4/11 ^{b c d}	82	64	3.62 \pm 0.84 ²
10	Controls	None	10/10 ^c	10/10 ^f	0	0	1.45 \pm 0.26 ⁴
11	Isolated Controls	None	0/11 ^a	0/11 ^a	N/A	N/A	5.05 \pm 0.87 ¹

* Bursal/Body Weight Range Method.

^{a b c} Values in the same column followed by the same letter are not significantly different (Chi Square Test; $\alpha = 0.05$).

^{1,2,3} Values in the same column followed by the same number are not significantly different (ANOVA; Tukey-HSD test; $\alpha = 0.05$).

Table 2. IBD Geometric Mean Serum Antibody Titers - 4 Weeks Post-vaccination

Group	Vaccine	Dose	IBD ELISA (% CV) *	IBD VN
1	LAHI	1/10 th	1373 (63.7) ^a	604 ^a
2	LAHI	1/50 th	584 (68.1) ^{a b}	117 ^a
3	LAHI	1/100 th	73 (108.0) ^{b c d}	31 ^b
4	Co. B	1/10 th	1074 (60.6) ^a	181 ^a
5	Co. B	1/50 th	51 (131.3) ^{c d e}	8 ^b
6	Co. B	1/100 th	11 (151.1) ^{d e}	4 ^b
7	Co. C	1/10 th	1405 (48.4) ^a	640 ^a
8	Co. C	1/50 th	313 (70.4) ^{a b c}	90 ^a
9	Co. C	1/100 th	57 (87.5) ^{c d}	24 ^b
10	Controls	None	6 (135.0) ^e	0 ^b

* % CV = Percent Coefficient of Variance.

^{a, b, c} Values in the same column followed by the same letter are not significantly different (ANOVA; Tukey-HSD test; $\alpha = 0.05$).

Table 3. Reovirus Geometric Mean Serum Antibody Titers - 4 Weeks Post-vaccination

Group	Vaccine	Dose	ELISA (% CV) *	VN
1	LAHI	1/10 th	4297 (46.9) ^a	302 ^{a b}
2	LAHI	1/50 th	2894 (57.8) ^{a b}	206 ^{a b}
3	LAHI	1/100 th	2815 (78.2) ^{a b}	110 ^b
4	Co. B	1/10 th	2936 (52.2) ^{a b}	300 ^a
5	Co. B	1/50 th	1758 (51.0) ^{a b}	50 ^b
6	Co. B	1/100 th	1938 (91.3) ^{a b}	55 ^{a b}
7	Co. C	1/10 th	1154 (81.6) ^{a b}	132 ^{a b}
8	Co. C	1/50 th	1234 (53.8) ^{a b}	44 ^b
9	Co. C	1/100 th	1051 (92.4) ^b	46 ^{a b}
10	Controls	None	1080 (77.6) ^b	59 ^b

* % CV = Percent Coefficient of Variance.

^{a, b} Values in the same column followed by the same letter are not significantly different (ANOVA; Tukey-HSD test; $\alpha = 0.10$).