

A Comparison of 2 Different IBD Drinking Water Vaccination Programs in Broiler Breeder Flocks Primed With a Recombinant IBD Vaccine in the Hatchery

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Introduction

Infectious Bursal Disease (IBD) is one of the most important diseases in young chickens. Several platforms of IBD vaccines have been developed for hatchery vaccination aimed to improve convenience and efficacy of IBD control. These include immune-complex, recombinant vector-IBD (rHVT-IBD) and more recently an attenuated-naked-IBD-vaccine. In Thai broiler-breeders, hatchery vaccination with rHVT-IBD is widely used; however, a revaccination using a conventional-live-IBD-vaccine is needed to mitigate the immunity-gap and prevent vaccination failure. This study aims to compare the serology, Bursa-to-Body-Weight ratio (BBW) and evaluate the broiler-breeder flock’s performance vaccinated with a recombinant-IBD vaccine and revaccinated with different conventional-live-IBD vaccines via drinking-water.

Material and Methods

Two flocks of 10,000 ROSS 308 broiler breeder Day-Old-Chicks (DOC) from the same grandparent flock were vaccinated by SC injection in the hatchery with a recombinant double construct vaccine rHVT-ND-IBD. At 16 and 30 days of age, flock 1 was revaccinated with an IBD-live MB strain vaccine, while flock 2 received the GM97 strain via drinking water. Serology for IBD and Newcastle Disease (ND) was performed at 1, 16, 30, 43, and 57 days of age using Synbiotics IBD ELISA and ND Hemagglutination-inhibition (HI) serology test. At 43 days, BBW ratio was determined by euthanizing 5 birds per flock. All other management and vaccination procedures were identical. Accumulative mortality and body weight (BW) were compared weekly up to 8 weeks of age (Table 1). The data was analyzed using Pairwise Wilcoxon test $P < 0.05$.

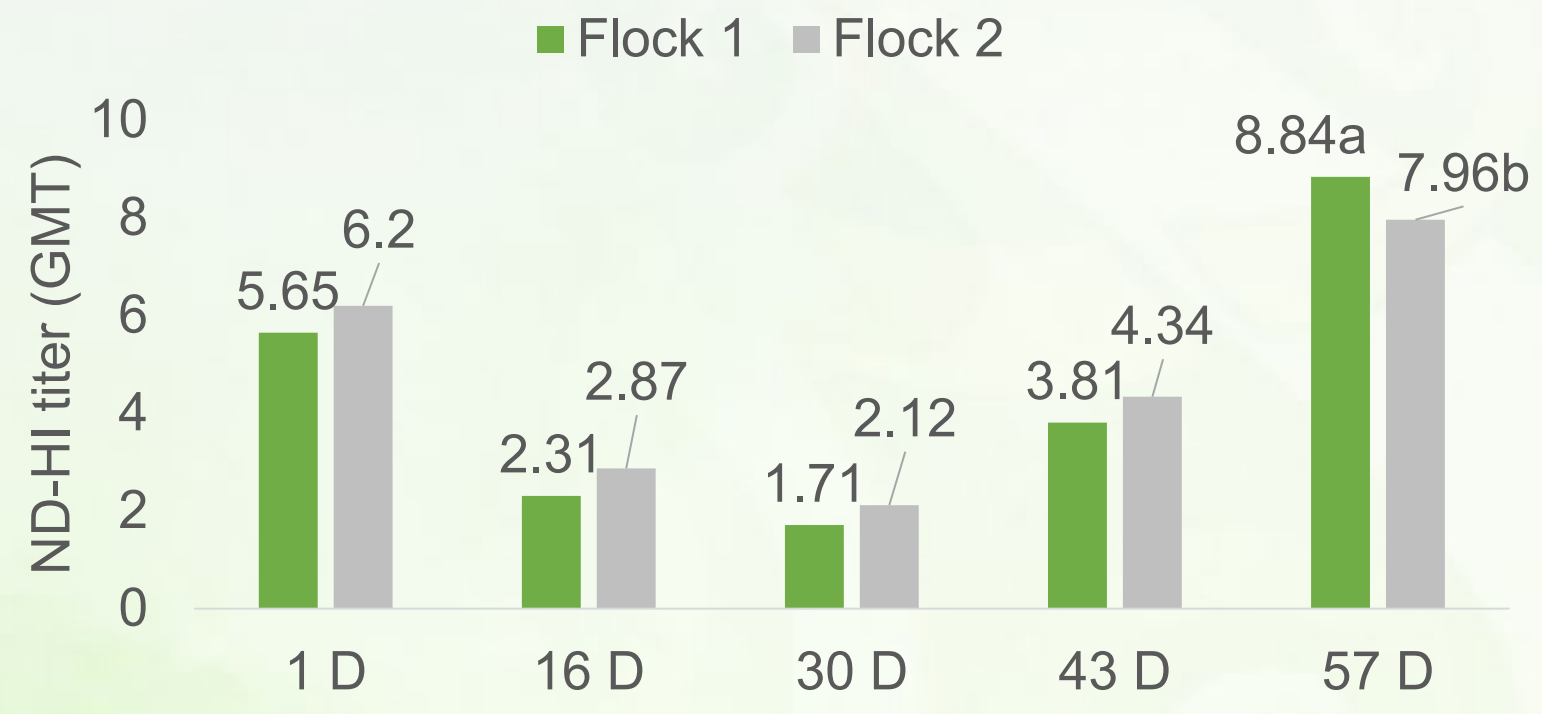
Table 1. Vaccination program and summary of monitoring parameters in 2 different flocks of day-old-chicks broiler breeders

Flock	Chicks Per Flock	DOC IBD Vaccine	At 16 and 30 Days Old IBD Vaccine / Route		IBD and ND Serology	BBW	Production Parameters
1	10,000	HVT-ND-IBD	MB Strain	Drinking Water	1,16,30,43 and 57 Days Old	43 days Old	Bodyweight, Accumulative Loss
2	10,000		GM-97 Strain				

Results and Discussion

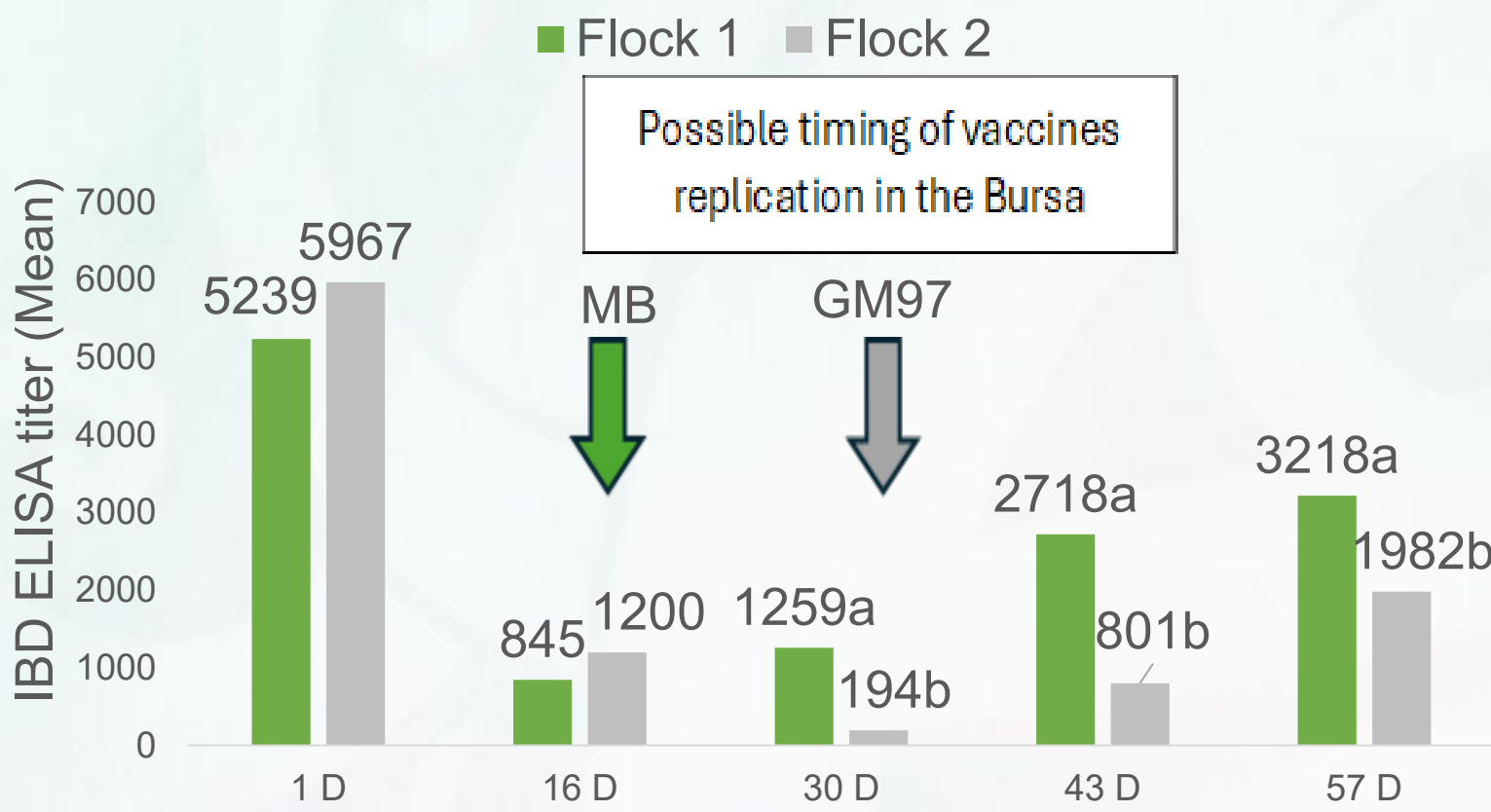
No significant difference of ND titers was found except for the lower ND titers ($P < 0.05$) found in flock 2 at 57 days old. Different letters within the same age group indicate significant differences (Figure 1).

Figure 1. ND-HI serology (GMT) comparison between flocks at 1, 16, 30, 43 and 57 day-of-age



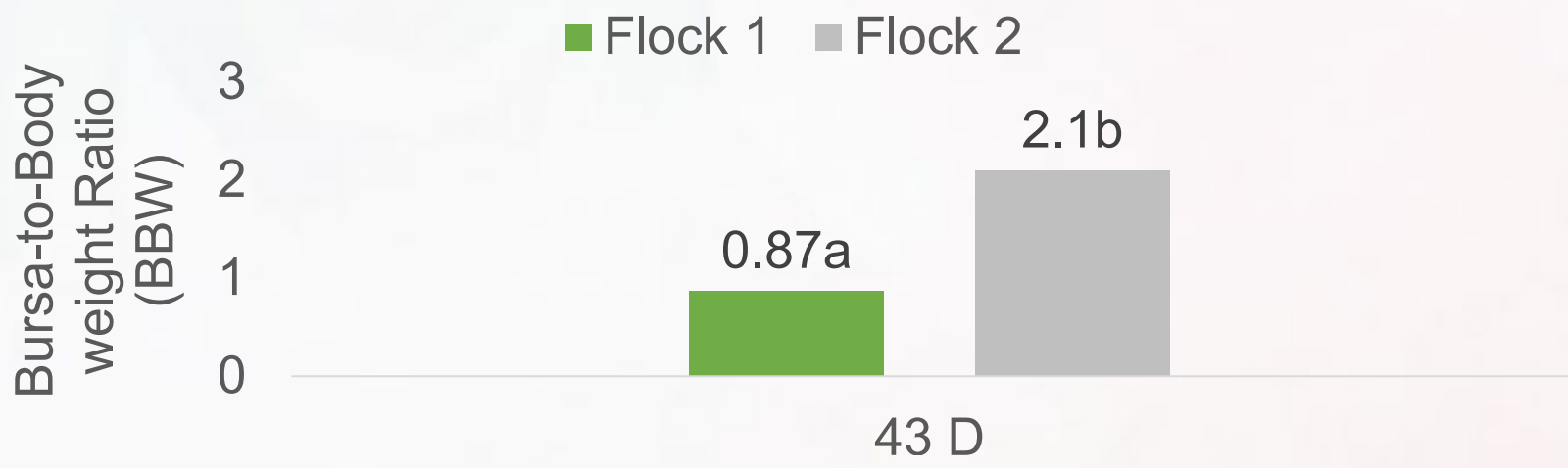
Significantly higher IBD mean titers were found in Flock 1 compared to Flock 2 at 30, 43 and 57 days old ($P < 0.05$). Different letters within the same age group indicate significant differences. The replication timing of the MB vaccine after the 1st vaccination was before 20 days of age and the replication of the GM97 vaccine was only after the 2nd vaccination at 30 days of age. This indicated a two-week earlier onset of immunity in the MB vaccinated birds (Figure 2).

Figure 2. IBD ELISA serology (Mean) comparison between flocks at 1, 16, 30, 43 and 57 day-of-age



Consistent with IBD titers, the BBW in Flock 1 (0.87) was significantly lower than that observed in Flock 2 (2.10) ($P < 0.05$). Different letters within the same age group indicate significant differences (Figure 3).

Figure 3. Bursa-to-Bodyweight (BBW) comparison between flocks at 43 day-of-age



No significant difference was found in BW between the flocks (Figure 4). A higher culling rate was noticed in Flock 1 during first 2 weeks of age due to chick quality and brooding management. After removing the first 2 weeks mortality, the MB group had accumulative mortality of 0.77% and the GM97 group had a higher accumulated mortality of 1.09% (Figure 5).

Figure 4. Comparison between flocks of average weekly body weight (BW)

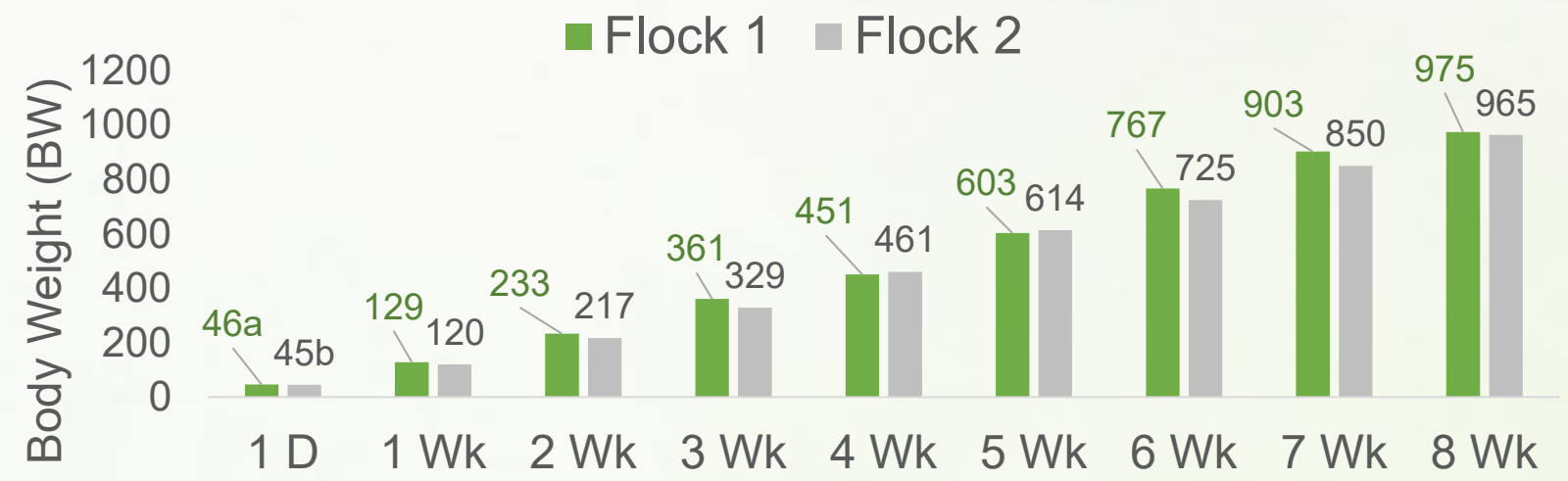


Figure 5. Comparison between flocks of average weekly mortality (%)



Conclusion

- There were no statistical differences in BW between the 2 flocks and the accumulative mortality after two weeks of age was lower in the MB vaccinated group. This indicates that the MB vaccine had no negative effect on the bird’s performance.
- The IBD ELISA results show that the MB-strain live-IBD vaccine was able to break through higher maternally-derived-antibodies and could overcome the interference caused by rHVT-ND-IBD, this indicates earlier immunity and provides a 13-day shorter immunity gap compared with the GM97.
- ND-HI titers at 57 days of age were significantly higher in the MB vaccinated flock indicating that the MB early replication in the Bursa did not compromise the bird’s immune reaction to the ND vaccination.
- MB vaccine is found to be a better candidate to be added on top of vector vaccine in breeders.

