Interest of adding a recombinant marek's disease vaccine to a standard RHVT-IBD vaccine on slow growth type broilers in la reunion

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Background

Marek's Disease (MD) is a common neoplastic and immunosuppressive disease affecting poultry populations worldwide. It is caused by the Marek's Disease Virus (MDV), which is an ubiquitous herpesvirus (Gallid Herpesvirus 2). MDV maintains a constant pressure on farms and keeping this disease under control through vaccination is critical.

In La Réunion island, slow growth broilers are raised either until 45 to 50 days (claustration type) or over 80 days of age (free-range type). For several years, Marek's and Gumboro disease have been controlled through a hatchery in-ovo vaccination with a vectored HVT-IBD vaccine for all type of broilers. For free-range type birds, a combination with a classical serotype 1 vaccine (classical CVI988 or RN1250) is generally preferred to reinforce MD's protection.

The present study consisted in extending the free-range vaccination program (combination of vHVT-IBD and recombinant MDV vaccine) to the rest of the production over a 5-months period and comparing the farms' performance with a reference period of 5.5 months over the same year (2022).

Experimental Design & Methods

A total of 459 broiler flocks (4,339 million broilers of Hubbard Ja757 yellow and white types) were vaccinated with a single vectored HVT-IBD vaccine (Group 1) while 439 flocks (4,3298 million broilers Hubbard Ja757 yellow and white types) with a combination of a vHVT-IBD vaccine associated to a recombinant MDV vaccine (Group 2) as follows:

- Group 1: 03/01/2022 to 28/04/2022 (341 flocks) and 15/09/2022 to 13/10/2022 (118 flocks)
- Group 2: 03/04/2022 to 30/08/2022 (348 flocks) and 17/10/2022 to 24/11/2022 (91 flocks)

The technical and economical performances of the batches were recorded though the usual operation softwares and processed.

Technical parameters recorded included: Mortality rates (Total, 0-10 days and > 10 days), condemnation rates, average daily weight gain rate (ADWG), feed conversion ratio (FCR), overall performance index (IP) and productivity per m² (PROD, in kg/m²).

The technical results were compared within identical genetic types (white or yellow types) as follows:

- Group 1 – White-type: 206 flocks
- Group 2 – White-type: 195 flocks
- Group 1 – Yellow-type: 248 flocks
- Group 2 – Yellow-type: 234 flocks

Results

Mortality rates were significantly higher in group 2 than in group 1 for both white and yellow-type broilers, at both 10 days and at slaughter age. Mortality results are summarized in table 1 below.

Table 1. Mortality rates at 10 days and slaughter age, for white and yellow-type broilers.

	Group 1 (mean)	Group 2 (mean)	P value (Wilcoxon Test)
10-days mortality (White)	**1.355***	1.92	0.0002
Total Mortality (White)	**3.079***	4.064	0.006732
10-days mortality (Yellow)	**1.27***	1.762	<0.000001
Total Mortality (Yellow)	**3.326***	4.005	0.002286

** Significant difference, Wilcoxon test*

For other technical parameters results were better in Group 2 in terms of condemnation rates and productivity per m² for both white and yellow-type chickens (statistically significant difference, Wilcoxon test), as shown in table 2 and 3 below.

Table 2. Technical results, for white-type broilers.

	Group 1 (mean)	Group 2 (mean)	P value (Wilcoxon Test)
Condemnation rate	0.3201	**0.2502***	0.000027
ADWG	43.29	43.98	0.180913
FCR	1.825	1.84	0.66683
IP	234.5	236.3	0.646848
PROD (kg/m²)	32.52	**33.16***	0.002286

** Significant difference, Wilcoxon test*

Table 3. Technical results, for yellow-type broilers.

	Group 1 (mean)	Group 2 (mean)	P value (Wilcoxon Test)
Condemnation rate	0.3063	**0.2071***	<0.000001
ADWG	44.95	**46.37***	0.014056
FCR	1.937	1.908	0.068233
IP	227.6	**237***	0.037542
PROD (kg/m²)	37.73	**39.41***	0.000386

** Significant difference, Wilcoxon test*

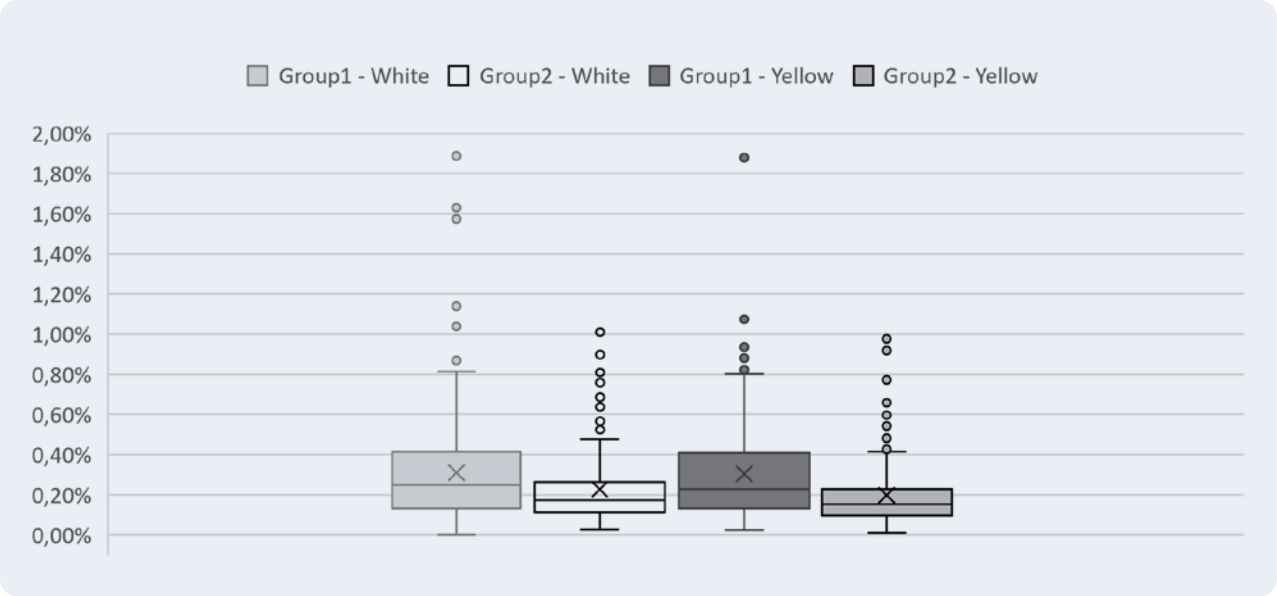

Figure 1. Condemnation rates in Groups 1 & 2, for white and yellow-type broilers.

For yellow-type broilers only, ADWG was significantly higher in Group 2 (+1.42 g ; Wilcoxon test – Table 3). Similarly, overall technical performance index (IP) was significantly higher in group 2 (+9.4 ; Wilcoxon test – Table 3).

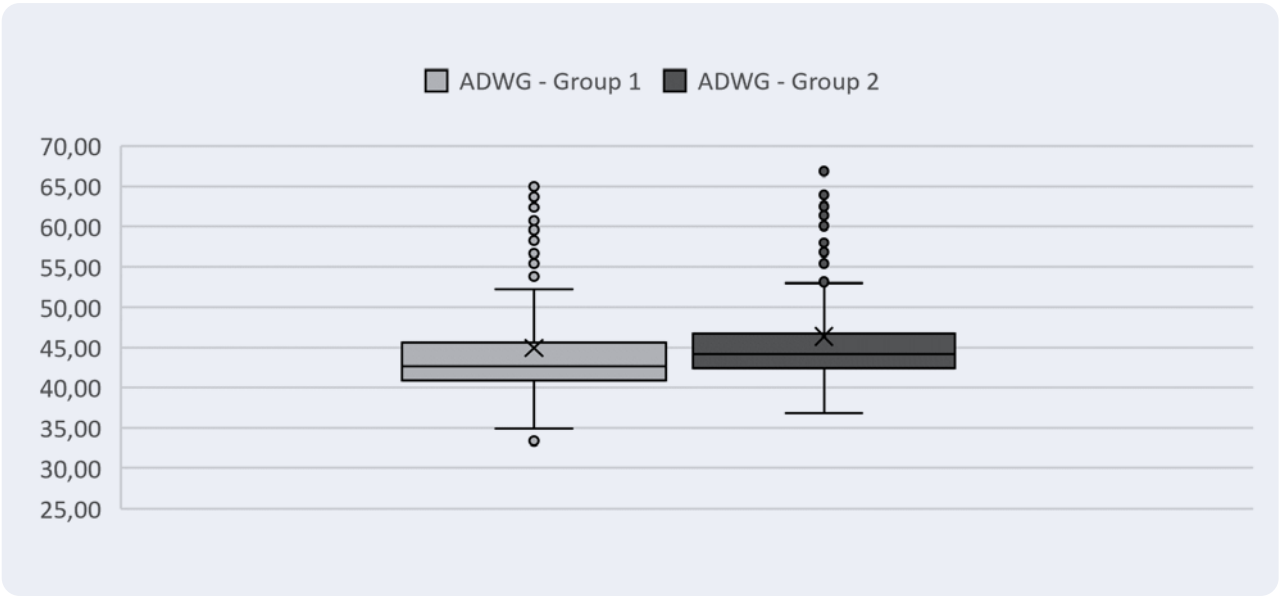

Figure 2. Average daily weight gain for yellow-type broilers.

Conclusion

Increase of mortality at early age was noticeable for the bivalent vaccination group but it coincides with the placement of new breeder flocks on the island and abnormal mortalities were observed in those flocks, beginning slightly before the change in the vaccination program.

Improved performances regarding ADWG and condemnation may show an interest for strengthening MD vaccination program for slow growth chicken in La Réunion. Especially, lower condemnation rates might indicate a subclinical impact of Marek's disease.

Further monitoring of the flocks may be considered to confirm these tendencies over year 2023. Also, aggregation of these data with other collected over the same period in La Réunion may be of interest in the future, as well as an economical analysis of the economical impact at farm level and return on investment of the new vaccination program, considering for both genetic type the improvement of the overall productivity per m², despite early mortalities issues observed.