HIPRA

BENEFITS OF A NEXT-GENERATION IMMUNE COMPLEX VACCINE AGAINST IBD IN SOUTH AMERICA, FIRST RESULTS IN BRAZIL

Gumboro disease - IBD – has been present in South America since the 1960s. Following several clinical outbreaks in the 1990s and 2000s, a period of stability began thanks to intensive vaccination programmes, both on the farm and in the hatchery.

The situation regarding the disease is currently considered to be fairly well controlled, although clinical disease continues to be detected in some countries, which suggests that the threat of the virus remains active and we must not lower our guard.

Moreover, in recent years several publications have appeared which refer to the great economic impact that the subclinical form of Gumboro disease can have on large South American farms where the circulation of the virus variant has been detected[1].

OBJECTIVE

GUMBOHATCH® is a new immune complex vaccine against Gumboro disease that has been developed by HIPRA.

This vaccine has introduced a **different formulation** (IgY of egg origin) and control parameters (detection of free IgY and neutralisation control) **to guarantee complete coating of the IBDV vaccine virus at the time of inoculation.**

The result of all these new improvements is a **next-generation immune complex vaccine that allows maximum potency of the vaccine to be maintained and consistent results to be obtained in the field, whilst at the same time avoiding the risk of immunosuppression.**

TRIAL

The objective of this study **was to evaluate the efficacy of GUMBOHATCH® where variant Gumboro virus is circulating on Brazilian farms where vaccination programmes are based on the administration of standard formulation immune complex vaccines.**

A total of 5,390,333 chicks were vaccinated with Gumbohatch® in ovo (at 18 days of incubation) in two cycles (Cycle 1 and Cycle 2) in accordance with the instructions in the package leaflet.

When they hatched, the chicks were distributed between:
- 80 commercial broiler farms in **Cycle 1**
- 81 farms in **Cycle 2.**
- All of which were located in the north east of Brazil.

- On each farm, the two groups were housed in separate units in similar conditions and monitored until the end of rearing (42 - 43 days of life).
- During this period, different safety and efficacy parameters were evaluated.
- Blood samples were taken and necropsies were performed on 15 chicks per group and farm at different times in each cycle.
- Antibody titres against the IBD virus were measured using CIVTEST® AVI IBD (HIPRA).
- During the necropsies, macroscopic and microscopic lesions of the bursa were evaluated and fresh bursal samples collected for PCR analysis and histopathology between 29 and 33 days of life.

In order to evaluate the efficacy of GUMBOHATCH®, a comparison was carried out (paired t-test) of the production results from Cycle 1 (first contact of the farms with the vaccine) **vs. Cycle 2** (stronger presence of the vaccine virus expected). The production cost differential between the two cycles was also calculated.

RESULTS

SAFETY

No adverse reactions were observed on any of the farms, irrespective of the cycle in which the birds were vaccinated with GUMBOHATCH®.

- The expected signs of replication of the vaccine virus were observed in the bursae, but no lesions that were consistent with circulation of the field virus.
- However, differences were observed in terms of histopathology in the bursae, with greater homogeneity of scores in Cycle 2 compared to Cycle 1 (data not shown).

EFFICACY

The serology results were as expected for GUMBOHATCH® in both vaccination cycles (mean titre for Cycle 1: 6141.14; mean titre for Cycle 2: 5593.47).

However, **major differences were seen between the PCR results for the two cycles.**

- In Cycle 1, 28.75% of samples were positive for GUMBOHATCH®, 28.57% were positive for virus variant (Molecular Group: 15); 28.57% were positive for GUMBOHATCH® and field virus and 14.28% were negative.
- In contrast, in Cycle 2, 100% of the samples analysed were positive for GUMBOHATCH® **(Figure 1)**.

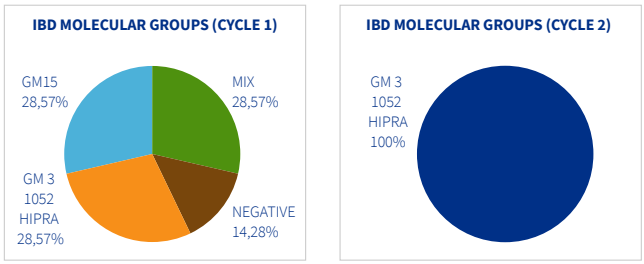

Figure 1. PCR results as percentage positivity of the bursal samples analysed in Cycle 1 and Cycle 2

Table 1 shows the comparison of the production results between Cycle 1 and Cycle 2. Overall, a **numerical improvement was seen in the majority of the parameters analysed in Cycle 2 compared to Cycle 1.** The figures were significant in the case of the EPEF (European Production Efficiency Factor) and FCR (Feed Conversion Ratio).

	CYCLE 1	CYCLE 2	P-VALUE
Units	5	5	—
Age at sacrifice	42.91	42.99	0.970
Weight at sacrifice (g)	2930	3053	0.595
ADG (g/day)	68.24	71.15	0.186
FCR	1.701	1.654	0.029*
Mortality (%)	3.64	3.73	0.881
EPEF	395.22	423.76	0.026*

Table 1. Comparison of production parameters between Cycle 1 and Cycle 2
*p-value < 0.005: statistically significant.

- In the second cycle of the use of GUMBOHATCH®, the variable costs were reduced by R$ 0.12/kg (0.022 $/kg) live weight compared to the first cycle.
- Or in other words, **in the second cycle with GUMBOHATCH®, the farms increased their profits by 22 $ for each 1,000 kg of live weight produced.**

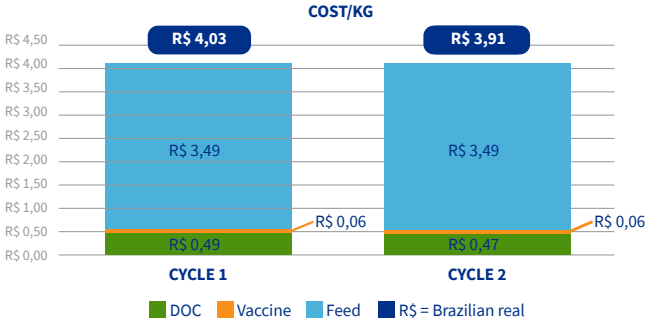

Figure 2. Production cost differential between Cycle 1 and Cycle 2.

CONCLUSIONS

The results obtained in this study allow the conclusion to be drawn that vaccination with GUMBOHATCH® is safe and confers adequate protection against circulation of the variant IBDV in chickens under field conditions in Brazil.

The differences observed in terms of efficacy between Cycle 1 and Cycle 2 appear to show that the vaccination programme based on the standard formulation immune complex vaccine was not providing adequate protection for the birds and field virus pressure had increased, with a negative impact on production results.

The use of a new-generation immune complex vaccine like GUMBOHATCH® allowed rapid colonisation of the vaccine strain from one cycle to another, improving the immune status of the birds and production results.

BIBLIOGRAPHY

Zachar *et al.*, 2016. Canadian Journal of Veterinary Research, Volume 80, Number 4, October 2016, pp. 255-261(7)