# COMPARISON BETWEEN GUMBOHATCH® AND A STANDARD-FORMULATED IMMUNE COMPLEX VACCINE ON A BROILER FARM IN IRAN

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## INTRODUCTION

Gumboro disease, also known as Infectious bursal disease (IBD), is caused by a very contagious virus distributed worldwide and is associated with high economic losses in the poultry industry. Proper selection and implementation of an IBD vaccine is crucial to effectively control the disease and its negative impact. GUMBOHATCH® is a next-generation immune complex vaccine against IBDV with a different formulation (IgY of egg origin) and control parameters to ensure the complete coating of the vaccine virus and the maintenance of maximum potency, even in the presence of high levels of maternal antibodies (MDAs), whilst avoiding the risk of immunosuppression. This study was performed with the aim of evaluating the safety and efficacy of GUMBOHATCH® when administered via the subcutaneous route in broilers compared to a standard-formulated immune complex vaccine in Iran, Gilan Province.

## MATERIALS AND METHODS

The trial was conducted on a research broiler farm with two identical houses. A total of 15,000-day-old ROSS 308 broiler chicks per group were randomly divided into two groups and vaccinated subcutaneously at the hatchery following the manufacturer's instructions. Both groups were monitored for 42 days. Group 1 was vaccinated with GUMBOHATCH® (HIPRA, Spain) and Group 2 with a commercial standard-formulated immune complex vaccine as a reference vaccine. Both groups were also vaccinated against Newcastle Disease (ND) and Infectious Bronchitis (IB) at one day of age with an H120 + B1 + 793/B strain (live, spray) and ND + Al (killed, H9 + Lasota strain, sc). In addition, the birds were vaccinated against Newcastle Disease with a clone vaccine (eye drop) at 8 days of age and twice with a Lasota strain via the drinking water at 16 and 28 days of age (Table 1).

| Group (G) | IBD hatchery vaccination | Other hatchery vaccines | Farm vaccines |
|---|---|---|---|
| **1** | GUMBOHATCH® (sc) | IB: H120 + B1 + 793/B strain (live, spray)<br><br>ND: ND + AI (H9 + Lasota strain, sc) | ND clone: 8 days of age (eye drop)<br><br>ND Lasota: 16 and 28 days of age (drinking water) |
| **2** | Standard-formulated immune complex vaccine (sc) | | |

**Table 1.** Vaccination programme per group

IBDV vaccine performance was evaluated during the study. Antibody response was evaluated for IBD with an IBD ELISA kit (IDEXX-XR) at 1, 21, 28, 35 and 42 days of age. ND (HI) and IB (ELISA IDEXX) antibody response was also evaluated at 35 and 42 days of age. Bursa to body weight ratio (BB ratio), histopathology and bursal imprints on FTA cards for PCR analysis were evaluated at 21 and 28 days. The birds' performance parameters (body weight, FCR, mortality and EEF) were also evaluated for both groups at the end of the study (42 days of age). The comparison between groups was performed by GraphPad Prism 9, T-Test and Mann-Whitney test.

## RESULTS

### VACCINE PERFORMANCE

The evolution of IBDV antibody titres after vaccination followed a similar pattern in both groups from day 21 up to day 35 with no statistically significant differences, except higher titres in Group 1 at 42 days of age (Fig. 1). The serological response for ND and IB was similar in both groups with no statistically significant differences. As expected with live vaccines, both groups replicated similarly in the bursa, resulting in a reduction of the BB ratio (between 0.1 – 0.2 at 21 days of age and 0.05 – 0.1 at 28 days of age). However, Group 1 showed statistically significantly lower histopathological score lesions compared with Group 2 at both 21 and 28 days of age (Fig. 2).

PCR results from bursal imprints showed replication of the vaccine virus in both groups from day 21 (60% positivity in Group 1 and 40% in Group 2) and remained positive thereafter.

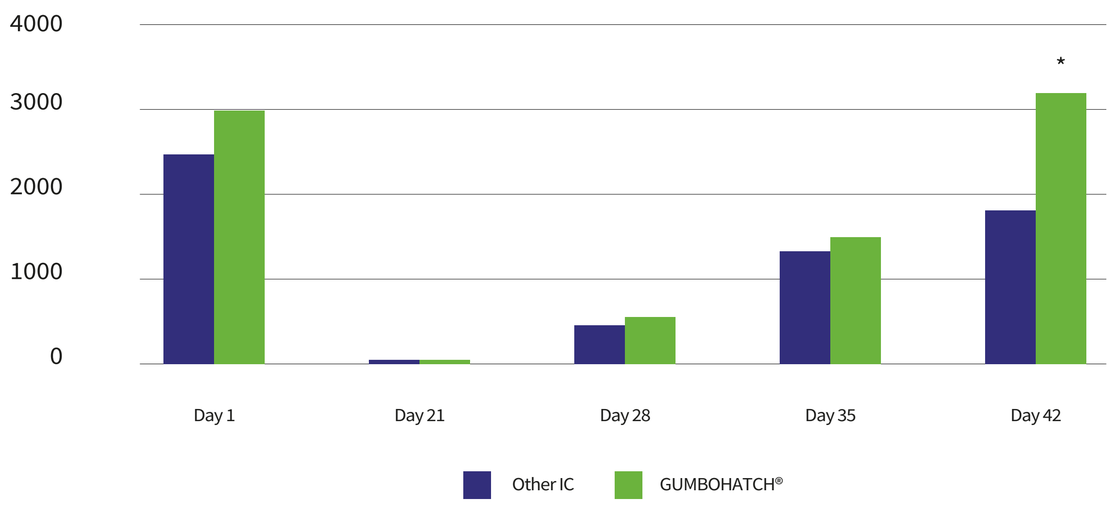


**Fig. 1.** Comparison of the evolution of IBDV antibody titres between both groups after vaccination (IDEXX-XR).

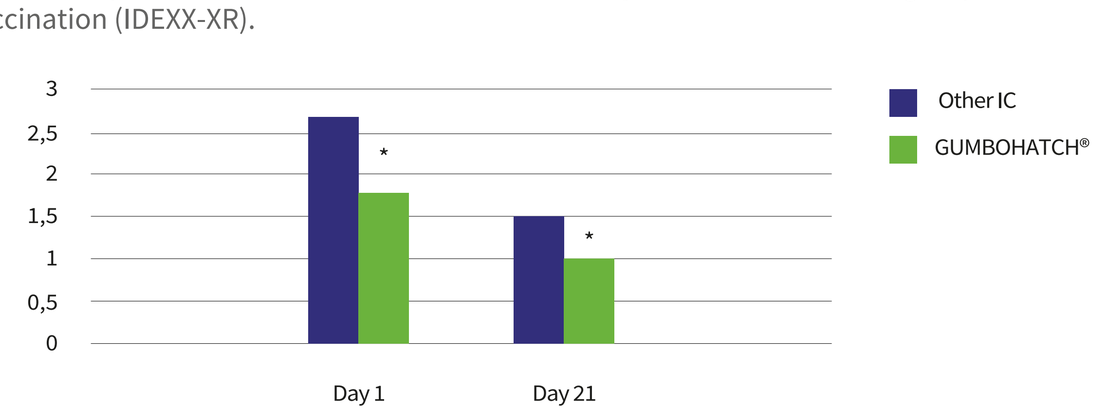


**Fig. 2.** Comparison of histopathological score lesions between both groups at 21 and 28 days of age.

### PRODUCTIVE PERFORMANCES

Group 1 showed better numerical results in terms of mortality, feed conversion ratio and European efficiency factor and a statistically significantly higher body weight (Fig. 3).

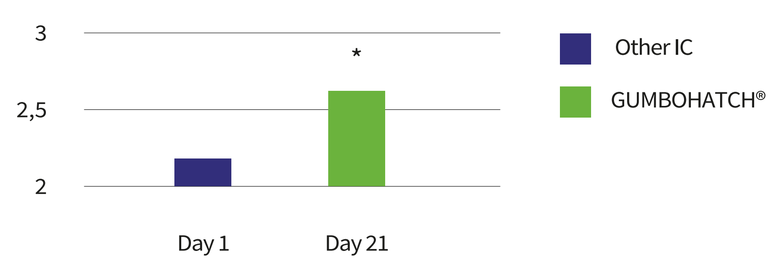


**Fig. 3.** Body weight comparison between both groups at 42 days of age.

## DISCUSSION

The results obtained in this study allow the conclusion to be drawn that vaccination with GUMBOHATCH® is safe and confers good protection (both humoral and by competitive exclusion) against IBD when administered via the subcutaneous route. Comparison of humoral response, histopathology, PCR and productive parameters with a standard-formulated immune complex vaccine also showed a better performance in the case of batches vaccinated with GUMBOHATCH®.

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