CLINICAL SAFETY AND EFFICACY OF IN-OVO COADMINISTRATION OF A NEW VACCINE AGAINST AVIAN COCCIDIOSIS TOGETHER WITH A VACCINE AGAINST INFECTIOUS BURSITIS DISEASE IN BROILERS UNDER FIELD CONDITIONS

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INTRODUCTION

Avian coccidiosis remains one of the most widespread, costly, and significant diseases in commercial poultry farming (Blake *et al.,* 2020).

The large capacity of hatcheries, their automation, and the advantage of individual dosing make in-ovo vaccination ideal in current poultry production conditions.

In this study, a field trial was conducted to assess the safety and efficacy of in-ovo (IO) coadministration of a commercial immunocomplex vaccine against infectious bursitis (GUMBOHATCH® HIPRA, S.A.) applied together with a new IO vaccine against avian coccidiosis (EVANOVO®, HIPRA, S.A.), compared to IO administration of this same IBD vaccine followed by thick-droplet spray vaccination of another coccidiosis vaccine (EVANT®, HIPRA, S.A.).

The objective of this multicenter, randomized, double-blind, double-simulation, positive control field trial was to evaluate the safety and efficacy of EVANOVO® when administered under field conditions in a commercial hatchery.

MATERIALS & METHODS

Vaccinations were performed in two Spanish commercial hatcheries using a double-simulation approach after random distribution of eggs into two groups: Positive Control Group and Experimental Group (Table 1). In the Positive Control Group, a total of 85,563 eggs were vaccinated with GUMBOHATCH® (Vaccine A) at 18 days of embryonic development. After hatching, chicks were vaccinated via thick-droplet spray with a reference coccidiosis vaccine (EVANT®, HIPRA S.A.) (Vaccine B) at 1 day of age. In the Experimental Group, IO coadministration of EVANOVO® (Vaccine C) and Vaccine A was performed on 85,715 eggs at 18 days of embryonic development. After hatching, chicks received a placebo via thick-droplet spray at 1 day of age. Additionally, in one of the hatcheries, both groups received IO administration of a Marek's vaccine.

Grupo	18 days of embyonic development	1-day-old chicks
Products in the Positive Control Group	Vaccine A	Vaccine B
Products in the Experimental Group	Vacccine A + Vaccine C	Placebo Vaccine B*
Route	*In-ovo*	Coarse spray
Dose	0.05 ml/egg	0.28 ml/bird

*** Solution with the same organoleptic characteristics as the solvent of EVANT® but without the adjuvant fraction to ensure bird staining and, therefore, maintain blindness at the farm level.*

Table 1. Experimental design

Once on the farms, both groups were housed in separate rearing units under identical and common management conditions and were monitored until the end of rearing. Adverse reactions, clinical signs, fecal appearance, production parameters, mortality rate, and different time points were evaluated blindly as safety or efficacy parameters. Additionally, specific parameters for coccidiosis and IBD were measured. The evolution of oocyst counts and intestinal lesions for coccidiosis was evaluated. On the other hand, serological response to IBD and qPCR for IBDV detection in the bursa of Fabricius were measured.

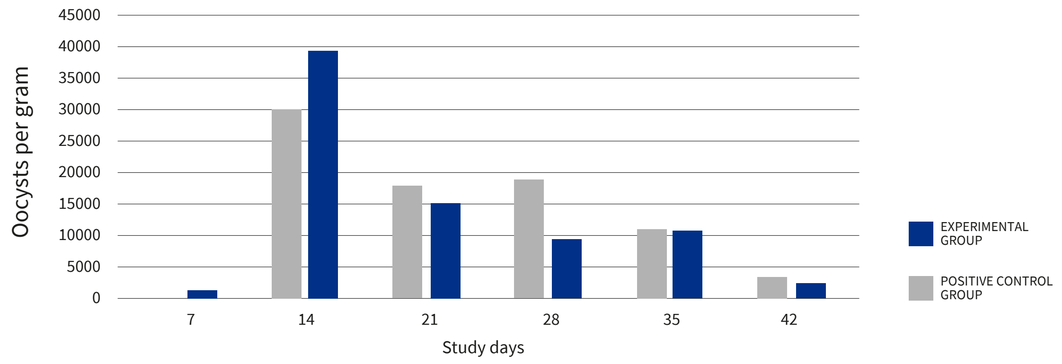
Qualitative variables were analyzed using a Chi-square test. Quantitative variables were analyzed using a Student's t-test if the conditions for application were met, or alternatively, a Mann-Whitney U test. SPSS® (SPSS Inc.) was used for statistical analysis. Values with P≤ 0.05 were considered statistically significant.

RESULTS

No adverse reactions were reported in either of the groups.
There were no statistically significant differences between the groups in terms of hatchability or chick body weight (Table 2).

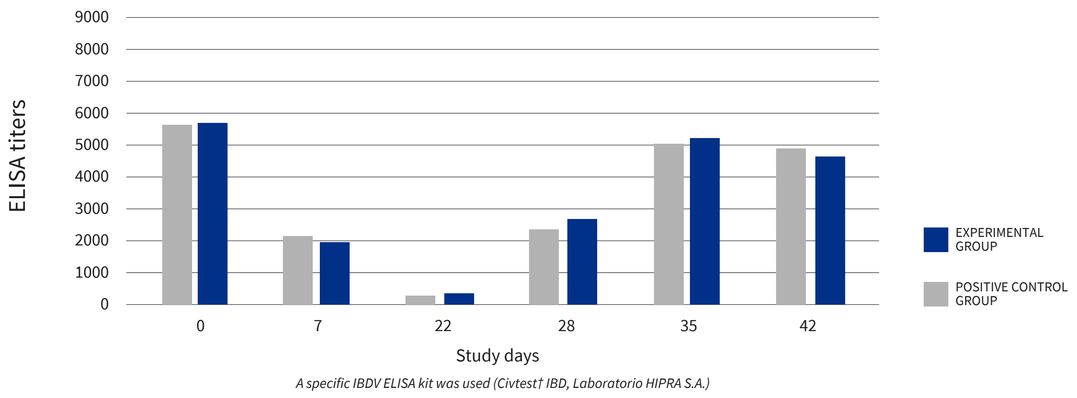
Group	Hatchability	Body weight (kg)		
		Día 0	Día 22	Slaughter day (Average Day 42)
	%	Average	Average	Average
Positive Control	90,11	0,04	0,96	2,78
Experimental	90,8	0,04	0,96	2,79
p-value	0,307	0,666	0,252	0,312

Furthermore, no clinically relevant intestinal lesions were observed in either of the two groups. Oocyst counts showed an expected replication pattern for attenuated by precociousness coccidia vaccines (Graph 1).



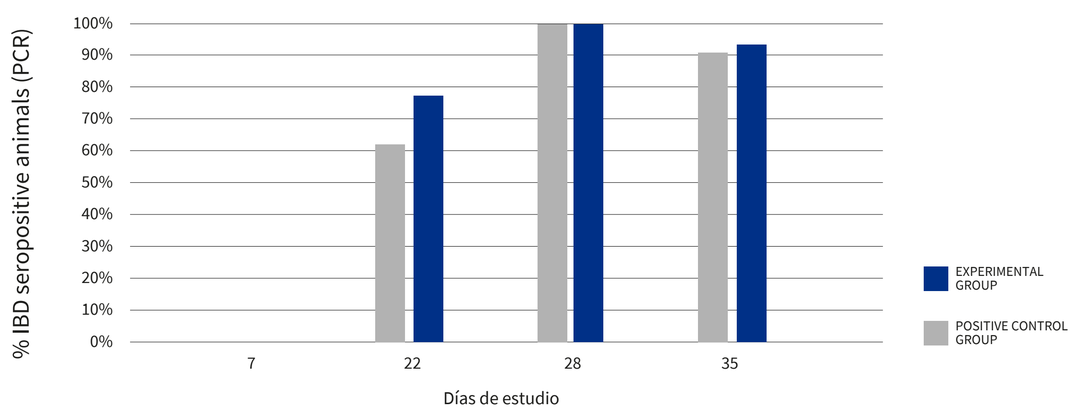
Graph 1. Evolution of oocyst counts in litter feaces

When evaluating parameters related to IBD, no differences were observed between the groups, neither in the detection of the vaccine virus in the bursa of Fabricius nor in the serological response induced by the IBD vaccine (Graphs 2 and 3).



A specific IBDV ELISA kit was used (Civtest† IBD, Laboratorio HIPRA S.A.)

Graph 2. Evolution of antibody titers using IBD ELISA technique



Graph 3. Detection of IBD virus in the bursa of Fabricius using IBD qPCR technique

There were no statistically significant differences between the groups in feed conversion rate or rearing mortality rate (Table 3).

Group	FCR	Mortality rate
	Average	%
Positive Control	1,66	3,69
Experimental	1,64	3,50
p-valor	0,813	0,791

Table 3. Results of production parameters

CONCLUSIONS

Based on these results, it can be concluded that the IO coadministration of both vaccines is a safe and effective approach for immunizing commercial broilers against coccidiosis and IBD.

REFERENCES

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