

COMPARATIVE ANALYSIS OF BROILER CHICKEN PRODUCTIVITY FOLLOWING VACCINATION WITH DIFFERENT COCCIDIOSIS VACCINES AND USING DIFFERENT ADMINISTRATION METHODS

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BACKGROUND AND OBJECTIVES

Avian coccidiosis remains a significant challenge in the poultry industry, impacting global poultry production and welfare. Various tools have been developed to mitigate the negative effects of the disease. Strategies such as the rotation of anticoccidial drugs with coccidiosis vaccines have been widely implemented in different countries and by producers worldwide to reduce the resistance of *Eimeria* field strains against anticoccidial drugs and restore sensitivity. The administration of avian coccidiosis vaccines has traditionally been performed in hatched birds by methods such as coarse spray or gel spray. Recently, EVANOVO®, a live vaccine administered *in ovo* (IO) against avian coccidiosis which contains attenuated precocious strains, has been registered in several countries. The aim of this study was to evaluate, under field conditions, the performance of broiler flocks vaccinated with this IO coccidiosis vaccine compared to coccidiosis vaccination with a live attenuated vaccine administered by coarse spray within the same company, which implemented a yearly rotation of anticoccidial drugs with attenuated coccidiosis vaccines (2 cycles of production).

MATERIALS & METHODS

The study included 659 standard broiler flocks of a Spanish poultry company, totalling 13,790,496 chickens (Table 1). Of these, 6,546,090 (333 flocks) were vaccinated in 2022 with the coarse spray vaccine (Group A – Attenuated vaccine with 5 strains of *Eimeria* oocysts), while 7,244,406 chicks (326 flocks) were vaccinated IO with EVANOVO® (Group B). Evaluation parameters included Slaughter Age, Mortality, Body Weight (BW), Average Daily Gain (ADG), Feed Conversion Ratio (FCR) and the European Production Efficiency Factor (EPEF). Seasonality and correlations between slaughter age and ADG, as well as BW and FCR, were considered.

Groups	IO admin.	Coarse Spray (CS) admin.	No. Animals	No. Flocks	Vaccination period
A	-	Vaccine B	6,546,090	333	5-22 / 10-22
B	EVANOVO®	-	7,244,406	326	5-22 / 10-22

Table 1. Experimental design

RESULTS

Productivity parameters revealed that Group B broilers exhibited a statistically significantly higher ADG compared to Group A (65.2 ± 3.45 g in Group B compared to 64.83 ± 3.05 g in Group A). Additionally, a significantly lower FCR was observed in Group B (1.612 ± 0.064 compared to 1.652 ± 0.073 for Group A), and the EPEF was significantly higher in Group B (391.85 ± 34.18 compared to 380.83 ± 33.80 in Group A). No significant differences were detected in mortality. No clear effect of seasonality during vaccination periods was identified. Interestingly, no clear correlation was seen between slaughter age and ADG. A positive correlation was detected between BW and FCR. No coccidiosis outbreaks were reported during the implementation of any of both coccidiosis vaccines. Higher intestinal lesions in Groups B and C compared to groups A and D.

Parameter	Group A	Group B	P-value
Nº of flocks (birds)	333 flocks (6,546,090 birds)	326 flocks (7,244,406 birds)	-
Average slaughter age (days)	42.92	40.36	0.191
Average slaughter weight (Kg)	2.79 ^A	2.63 ^B	0.027
Total mortality (%)	3.26 ± 3.9	3.56 ± 2.23	0.22
Average daily gain (gr/day)	64.83 ^A ± 3.05	65.2 ^B ± 3.45	0.0272
Feed conversion rate (FCR)	1.652 ^A ± 0.073	1.61 ^B ± 0.065	<0.001
European Performance Efficiency Factor (EPEF)	380.83 ^A ± 33.79	391.85 ^B ± 34.18	<0.001
Company costs (€/Kg chicken meat)*	1.038 ^A	1.023 ^B	<0.001

*Costs are calculated according with the average reference prices for the company, including investments in feed, day old chicks, antibiotics and strategies against coccidiosis.

Table 2. Overall performance

DISCUSSION AND CONCLUSIONS

In conclusion, broilers coccidiosis vaccinated *in ovo* exhibited a more efficient performance compared to the previous year's chickens vaccinated with a coarse spray vaccine, possibly due to more accurate administration, reduced handling of hatched chicks, and effective coverage of field *Eimeria* challenges. The control of both clinical and subclinical coccidiosis is expected to be more efficient with the proper replication of the *in ovo* vaccinal strains, having a positive effect in the overall performance of the birds. This study indicates that EVANOVO® provides a more efficient performance compared with other coccidiosis vaccines administered by other methods, being both suitable in RWA (raised without antibiotics) & standard production environments.