SAFETY OF TWO *SALMONELLA* VACCINES AND ZOOTECHNICAL PERFORMANCE AFTER VACCINATION OF LAYING HENS FOR PREVENTION OF SALMONELLOSIS

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Introduction

Salmonellosis is among the diseases of long-cycle commercial birds that cause economic losses and highlight risks related to public health. According to the scientific literature, there are more than 2500 serovars described, and *Salmonella* Gallinarum and *Salmonella* Enteritidis serovars come up with relevance, being responsible for typhoid and paratyphoid infections in poultry flocks.

Poultry birds' vaccination is a form of prevention and a premise of biosecurity that occurs earlier in the rearing phase and helps the management avoid challenges in the production phase. Our objective was the safety evaluation of the vaccination within 35 (thirty-five) days of bird's release in free cages for protection against salmonellosis and the monitoring of the zootechnical performance during the entire rearing phase.

Materials and Methods

The experimental design was completely randomized (DIC), consisting of five treatments with four replications of 90 birds each was used for zootechnical performance. The chicks were created on the floor in 10 m2 boxes. Were measured at the 5th, 10th, and 14th weeks the body weight. The feed consumption and feed conversion, measurements were taken from the 6th life of the birds until the end of the rearing phase. The viability rate was checked daily in the experimental groups. It had three different experimental groups for monitoring the vaccines. The first controlled one without vaccination the second experiment within the inactivated vaccine protection against *Salmonella* Enteritidis and *Salmonella* Gallinarum so as another protection group against *Salmonella* Gallinarum associated with viral antigens vaccines were provided twice for birds 35 to 105 days old the safety of the monitored vaccines.

All procedures and animal care followed the basic principles of animal experimentation. Recommended by the Ethics Committee on the Use of Animals (Protocol 51/2021).

Materials and Methods

The normality and homoscedasticity of the data were verified using the Lilliefors and Cochran and Bartlett tests, respectively. Data were analyzed using the ANOVA procedure and the means were compared using the Tukey test at 5% probability. Qualitative responses or when the data violated the principle of normality and/or homoscedasticity were analyzed using nonparametric statistics and the medians were compared using the Kruskal-Wallis test.

Results and Discussion

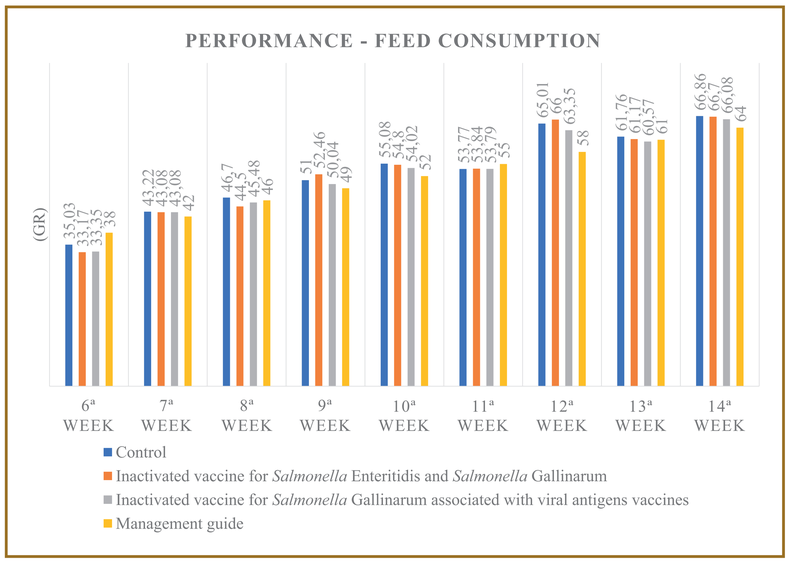
In the zootechnical performance evaluation, all indices were compared to the standard of the used bird lineage. Feed consumption was not altered by the treatments of the different vaccines. This is an important point as many oily vaccines cause pain in animals and decrease the amount of feed ingested. Thus, the weight of the animals did not show statistical differences between the groups. Demonstrating that the growth physiology of the birds was not influenced by the treatments. For the viability of the treatments, there was no influence of the vaccines, a measure that is important to measure the quality of the vaccines also of the vaccination process. As a more practical way to use the zootechnical data in the field, we have the uniformity of the herd, which is important for the layers hens as an index that was not influenced by the treatments, obtaining all groups at the end of the rearing, results above 90% of uniformity.

In the evaluation of the safety of vaccines for *Salmonella* Enteritidis and *Salmonella* Gallinarum so as another protection group against *Salmonella* Gallinarum associated with viral antigens inactivated vaccines performed through necropsy of the birds and analysis of the space of vaccine deposition between the superficial and deep muscles of the breast of the birds. It was possible to verify only the expected lesion scores for an intramuscular vaccine that did not present abnormal reactions and kept the welfare of the birds as the focus of the project.

Conclusion

- The welfare of birds and biosecurity was improving with less management during the evaluated phase.
- It is safe to vaccinate birds at 35 days of age with the inactivated vaccine for *Salmonella* Enteritidis and *Salmonella* Gallinarum also for *Salmonella* Gallinarum associated with viral antigens vaccines.
- There was no clinical occurrence of the disease.

Graph 1: Weekly feed consumption of birds submitted to different vaccination programs (6th to 14th week of age of birds)



Graph 2: Weekly viability of birds submitted to different vaccination programs (6th to 14th week of age of birds)

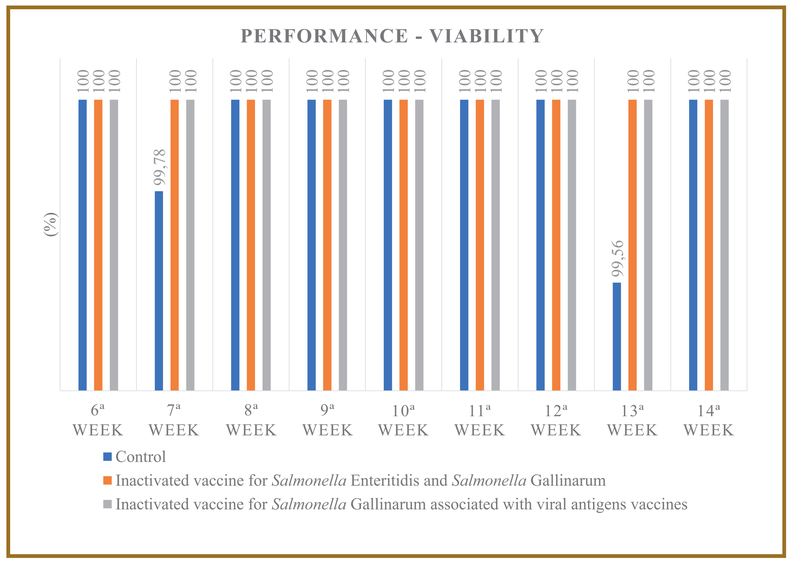


Figure 01: Safety for control group

Figure 02: Safety for inactivated vaccine for *Salmonella* Enteritidis and *Salmonella* Gallinarum

Figure 03: Safety for inactivated vaccine for *Salmonella* Gallinarum associated with viral antigens vaccines

Table 01: Performance data of birds submitted to different vaccine programs

Rearing Phase I (6th - 10th week)							
TREATMENT	FIB[1]	FID[2]	W[3] 5th (g)	W[3] 10th (g)	GW[4] (g)	FC[5]	Viability[6]
A7	1554,6	45,7	355,0	863,1	506,4	3,07 b	99,56
B8	1537,5	45,2	342,9	860,9	518,0	2,97 a	100,00
C9	1521,5	44,7	349,8	857,6	507,9	3,00 ab	100,00
CV %	1,65	1,65	2,15	1,41	1,89	1,73	1,79
P-value	0,1606	0,1626	0,0938	0,8011	0,1765	0,0335	0,3386
Rearing phase II - (11th – 14th)							
TREATMENT	FIB[1]	FID[2]	W[3] 5th (g)	W[3] 10th (g)	GW[4] (g)	FC[5]	Viability[6]
A7	1718,7	61,3	863,1	1135,5	272,4	6,36	99,78
B8	1721,1	61,5	860,9	1126,6	265,7	6,48	100,00
C9	1694,2	60,5	857,7	1122,6	264,9	6,40	100,00
CV %	1,79	1,79	1,41	1,09	3,47	3,82	-
P-value	0,3386	0,3383	0,8011	0,3239	0,4586	0,7424	0,3966
Total phase - (6th – 14th)							
TREATMENT	FIB[1]	FID[2]	W[3] 5th (g)	W[3] 10th (g)	GW[4] (g)	FC[5]	Viability[6]
A7	3273,3	52,8	355,0	1137,1	780,5	4,15	99,55
B8	3258,6	52,6	342,9	1126,6	783,7	4,16	100,00
C9	3215,7	51,9	349,8	1122,6	772,8	4,16	100,00
CV %	1,64	1,64	2,15	1,06	1,47	1,10	-
P-value	0,246	0,2458	0,0938	0,1814	0,342	0,9254	0,1101

[1] Mean feed intake (g/bird); [2] Mean feed intake (g/bird/day), [3] Mean week weight (weeks of age), [4] Mean weight gain (g), [5] Mean feed conversion/weight (kg of feed/kg of weight), [6] Viability, [7]A (control group), [8]B (Inactivated vaccine for *Salmonella* Enteritidis and *Salmonella* Gallinarum) and [9]C (Inactivated vaccine for *Salmonella* Gallinarum associated with viral antigens vaccines)

Table 02: Uniformity data of birds submitted to different vaccine programs

UNIFORMITY			
GROUPS	5th week	10th week	14th week
A1	88,00	90,00	90,80
B2	84,00	93,00	92,60
C3	80,00	96,80	92,90
RATING SCALE			
POOR	FAIR	GOOD	EXCELLENT
<69%	70 – 79%	80 – 89%	> 90%

[1]A (control group),
[2]B (Inactivated vaccine for *Salmonella* Enteritidis and *Salmonella* Gallinarum),
[3]C (Inactivated vaccine for *Salmonella* Gallinarum associated with viral antigens vaccines)

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