

The efficacy of an attenuated coccidiosis vaccine compared to different feed additives on production performances and coccidiosis outbreaks in Moroccan field

Zohra Bamouh¹, Noha Semmate¹, Ismail Kerbal¹, Oussama Chorfi², Khalid Omari Tadlaoui¹

¹ Department of Research and Development, MCI Santé Animale, Lot. 157, ZI Sud-Ouest P.O. Box 278, Mohammedia 28810, Morocco

² Cabinet Vétérinaire Dr Oussama Chorfi 77 bd Mohamed V lotiss. Laamiri Berrechid, Morocco

Introduction

Coccidiosis is caused by the apicomplexan protozoan *Eimeria* and is recognized as the most important parasitic disease of poultry (Conway & McKenzie, 2007). Coccidiosis seriously affects the growth and feed utilization of infected animals resulting in loss of productivity (McDougald, 2003; Safari et al., 2004).

Conventional disease control strategies rely heavily on chemoprophylaxis (anticoccidial feed additives).

With increasing regulations and bans on the use of anticoccidial drugs coupled with the associated costs of developing new drugs urges, there is a pressing need to develop novel approaches and alternative control strategies such as vaccination.

The current bulletin summarizes the zootechnical results of the use of a coccidiosis vaccine "Paracox 5" under Moroccan field conditions in 5 farms, including 3 free-range chicken farms marketed under the brand name "EL HOR" and supervised by Dr Oussama Chorfi. In conclusion, "Paracox 5" vaccine improved the zootechnical performance of both broiler and free-range chickens compared to control batches, right from the first time it was used in the farms.

Materials and Methods

- **Farms:** The 5 selected farms had a history of a clinical coccidiosis outbreaks with a program of prevention based on monovalent ionophores or on essential oils for free-range chicken.

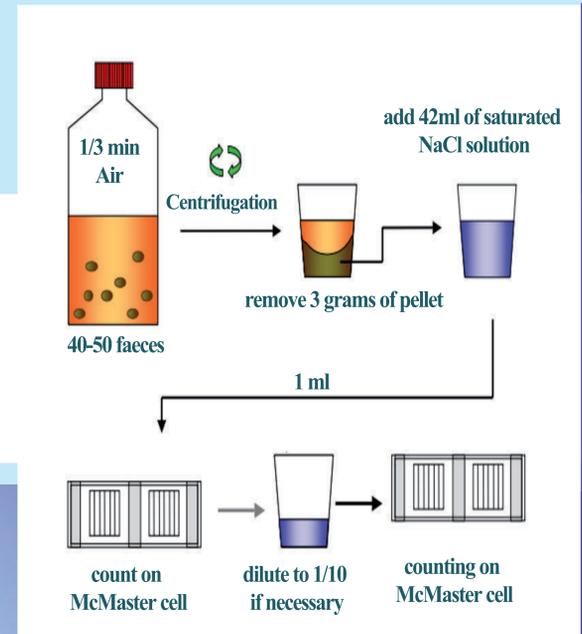
- **Vaccine:** Paracox-5 is a translucent, aqueous suspension of oocysts derived from five precocious lines of coccidia, presented as a live, attenuated oral vaccine.

- **Oocyst count (OPG):** the test was carried out at the MCI Santé Animale laboratory, using a quantitative technique based on the MacMaster chamber from droppings collected during the rearing period at specific ages: 7 days, 21 days and 35 days.

- **Monitoring post "Paracox 5" vaccine administration:** All the 5 farms were monitored in terms of zootechnical parameters: Mortality, Body weight, Average Daily Gain, Feed conversion and Performance Index until the birds were slaughtered. On each farm, a control group was kept untreated. Both batches (vaccinated and control) were raised under the same conditions and slaughtered at the same age in all the farms.

- **Statistical analyses:** Comparisons were carried out between vaccinated and control groups using the t-student test (Values of $p \leq 0.05$ were considered significant).

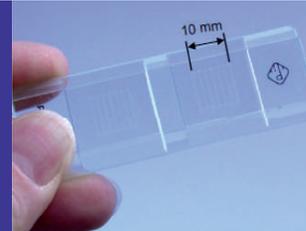
Age of vaccination (days)	Route of administration
3-4th day	Drinking water in the farm



- 1) calculation of the number X of oocysts per gram of faeces:
- 2) let N be the number of oocysts found in the chamber
- 3) 0.15 ml is the volume of a Mac Master cell chamber
- 4) 45 ml is the total volume of the suspension

$$X = \frac{N \times 45}{0.15 \times 3} = 100 \times N$$

Mc Master Cell



Results & discussion

All obtained zootechnical results of the 5 broiler farms are summarized in tables 1 & 2 below:

Broiler Farm (s)	Batches	Mortality (%)	Bodyweight (gr)	Average daily gain (gr)	FCR (Feed conversion)	IPE (European Index of performance)	Coccidiosis outbreaks
1	Vaccinated	3,33%	2357	48,10	1,80	258	0
	Control	3,47%	2249	45,89	2,05	216	1
2	Vaccinated	6,84%	2564	52,32	1,88	259	0
	Control	7,82%	2500	51,02	1,94	242	0
Average	Vaccinated	5,09%	2460,5	50,21	1,84	259	0
	Control	5,65%	2374,5	48,46	2,00	229	1

Free-range chicken Farm (s)	Batches	Mortality (%)	Bodyweight (gr)	Average daily gain (gr)	FCR (Feed conversion)	IPE (European Index of performance)	Coccidiosis outbreaks
1	Vaccinated	4,00%	1840	33,00	2,5	126,7	0
	Control	5,10%	1700	29,50	2,7	103,7	0
2	Vaccinated	6,00%	2080	35,00	2,6	117,5	0
	Control	8,54%	1860	28,00	2,9	88,3	1
3	Vaccinated	3,84%	1910	32,00	2,7	114,0	0
	Control	3,50%	1650	27,5	3,2	82,9	1
Average	Vaccinated	4,61%	1943	33	2,6	119,4	0
	Control	5,71%	1737	28	2,9	91,6	2

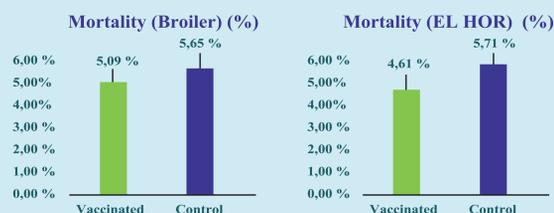
1) Mortality

The Mortality was recorded daily. Figure 1 show comparative results between vaccinated and control animals.

Figure 1:

Mortality recorded in broiler and free-range chicken farms after "Paracox 5" vaccine administration

Statistical analysis showed no significant difference between vaccinated and control batches in terms of mortality rate ($p=0.04$).



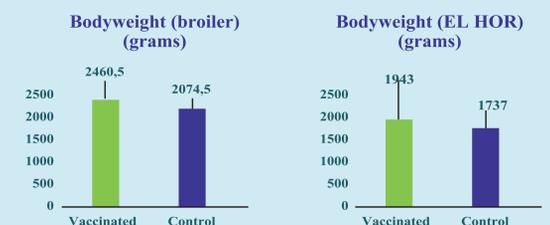
2) Body weight

Body weight was recorded weekly. Figure 2 show the average body weight at slaughter in vaccinated and unvaccinated birds.

Figure 2:

Bodyweight results obtained in vaccinated and controls flocks at slaughter in broiler and free-range chicken (EL HOR) farms

The results of the statistical analysis showed that there was a significant difference between the vaccinated batches and the control batches in terms of body weight at slaughter ($p \leq 0.05$).



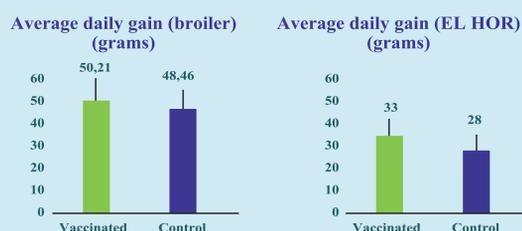
3) Average daily gain (ADG)

Average daily gain was calculated weekly. Figure 3 shows the results obtained at the end of the band.

Figure 3:

comparison of average daily gain between vaccinated and controls flocks at slaughter in broiler and free-range chicken (EL HOR) farms

There is a significant difference between the vaccinated batches and the control batches in terms of average daily gain ($p \leq 0.05$).



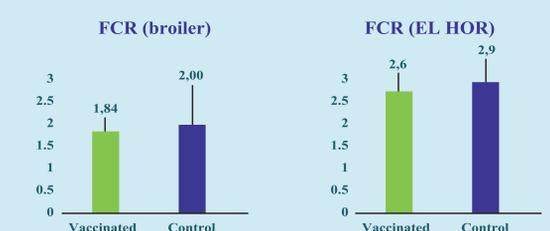
4) Feed Conversion Ratio (FCR)

Feed conversion ratio was calculated at the end of the band (Figure 4).

Figure 4:

Feed Conversion Ratio results of both vaccinated and controls flocks at the end of the band in broiler and free-range chicken (EL HOR) farms

The feed conversion of the vaccinated batches was significantly lower compare to the control batches ($p \leq 0.05$).



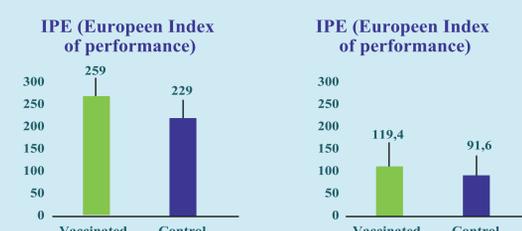
5) European Performance Index (IPE)

European Performance Index was calculated as follow:
IPE = (ADG * Viability * 10) / FCR Viability = 1 - Mortality

Figure 5:

European Performance Index results of both vaccinated and controls flocks at the end of the band in broiler and free-range chicken (EL HOR) farms

There is a significant difference between the vaccinated batches and the control batches in terms of European performance index ($p \leq 0.05$).



Conclusion

In conclusion, obtained results showed that the "Paracox 5" vaccine improved the zootechnical performance of both broiler and free-range chickens compared with control batches, right from the first time it was used on the farms. This can be explained by the high prevalence of sub-clinical coccidiosis in the broiler segment, which is difficult for farmers to detect. It should be noted that we noticed a clear improvement in the already vaccinated barns compared to the rest of the barns in the following batches. This might be the result of a re-sensitization of the coccidian population to anticoccidial drugs, as a consequence of the introduction of sensitive vaccine strains in the poultry houses. This is in agreement with earlier observations, such as those described by Landman (2011).

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