

Use of Enviva EO (DuPont) and Butirex (Novation), two natural alternatives to coccidiostats: floor pen trial in chickens for fattening

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En la prueba llevada a cabo en jaulones en suelo, se probó la sensibilidad de un aislado de Eimeria a la combinación de dos productos, Enviva EO+Butirex. Se utilizaron 392 pollos COBB 500 desde el primer día de edad, aunque la infestación con Eimeria se realizó a partir del 15 día de prueba. Para llevar ésta a cabo se inocularon los pollitos con oocistos esporulados de cepas de Eimeria aislados por personal del Departamento de Patología Animal de la Facultad de Veterinaria de la Universidad de Zaragoza. Los cuatro tratamientos previamente formados recibieron la misma infestación y de ellos, tres recibieron (de 1 a 48 días) distintas combinaciones de la combinación señalada mientras que el tratamiento control recibió las dosis recomendadas de los coccidiostatos Maxiban (1-21 días) y Monteban (22-48 días).

En los días 25, 35 y 48 de prueba, se midieron los distintos parámetros productivos, la excreción de oocistos, así como las lesiones intestinales y observaciones clínicas relevantes.

Palabras claves: Enviva EO; Butirex; Eimeria; Pollos; Coccidiostatos

In this floor pen trial, the sensitivity of a recent field isolate of Eimeria to Enviva EO+Butirex was tested in chickens for fattening. Four treatment groups were formed, all of them were inoculated with sporulated oocysts of the recently isolated Eimeria field strains. Chickens from three experimental groups were treated in feed at different doses of Enviva EO+Butirex. Chickens from the remaining experimental group were treated with Maxiban-Monteban with the authorised dose of the respective anticoccidials.

Feed consumption, body weight change, oocyst excretion, intestinal lesion scores and clinical observations were used as parameters to evaluate the sensitivity of the strains to the different coccidiostats.

Keywords: Enviva EO; Butirex; Eimeria; Chicken; Coccidiostats

Materials and methods

The study was conducted according to a randomised design with four treatment groups each containing seven pens of 14 birds. Three groups were treated with in-feed administration of Enviva EO+Butirex (started dosing on day 1 through day 48). The remaining birds were treated with in-feed administration of Maxiba (from day 1 to day 21) and Monteban (day 22 to 48) equivalent to the authorised doses. All birds

were inoculated (day 15) via oral gavage with sporulated oocysts of *Eimeria tenella*, *Eimeria acervulina* and *Eimeria maxima*. The birds were evaluated on technical parameters feed uptake and body weight change, oocyst excretion (days 25, 35 y 48) and intestinal lesion scoring (days 21, 35 y 48) as well as daily clinical observations throughout the study.

Four treatment groups of 98 birds (7 repeats of 14 birds) were used, totalling 392 birds.

- Infected + Treatment 1 (Coccidiostat: Maxiban 0-21, Monteban 22-final)
- Infected + Treatment 2 (100 gr/ton Enviva EO +750 gr/ton Butirex)
- Infected + Treatment 3 (200 gr/ton Enviva EO + 750 gr/ton Butirex)
- Infected + Treatment 4 (100 gr/ton Enviva EO + 1.500 gr/ton Butirex)

Coccidia infection. Infection organisms

Pathogenic strains of *Eimeria acervulina*, *E. tenella*, and *E. maxima* were used. The oocysts were provided by the Investigator Parasitology, Dr. Emilio del Cacho, Department of Animal Pathology, University of Zaragoza, Spain. The strains used for this study were recent field isolates (2012) obtained by this Department from local farms (Zaragoza area), and propagated on purpose for the present study.

Description of animals

392-day-old male chickens Cobb 500 were used. 412 birds (20 spare) were purchased from Grupo Sada hatchery in Sastago (Zaragoza) and in the Veterinary Faculty they were allocated randomly in floor pens. Chickens were vaccinated against infectious bronchitis at the hatchery. The chickens included in the study were not treated with any anticoccidial containing products before arrival. They were healthy, of same age and breeding. This experiment was following the EU principals for animal care and experimentation. Procedures included were in agreement with the Ethical Committee for animal care and experimentation of UZar.

Statistical analysis

Feed conversion, body weight and mortality were considered the primary parameters. Treatments with Enviva EO+Butirex were to be considered as efficacious if at least one of the primary parameters was no significantly different in comparison with animals treated with coccidiostats. Lesion scores and faecal oocyst counts were considered secondary parameters.

Table 1. Cumulative Performance Parameters.

Treatment	N pens	AWG _{1-48d}		ADG _{1-48d}		FCR _{1-48d}	
		Mean	StdDev	Mean	StdDev	Mean	StdDev
1	7	3100	205.5	66	4.4	1.97	0.057
2	7	3185	347.5	68	7.4	1.96	0.137
3	7	3159	110.5	67	2.4	1.99	0.090
4	7	3210	279.4	68	5.9	2.02	0.168
All	28	3163	240.9	67	5.1	1.98	0.116
P (t) _{1 ≠ 2, 3, 4}		0.86		0.86		0.80	

Within each group, values with different superscripts are significantly different (P<0.05).
 Treatment 1 (Coccidiostat: Maxiban 0-21, Monteban 22-final).
 Treatment 2 (100 gr/ton Enviva EO +750 gr/ton Butirex).
 Treatment 3 (200 gr/ton Enviva EO + 750 gr/ton Butirex).
 Treatment 4 (100 gr/ton Enviva EO + 1.500 gr/ton Butirex).

Results and discussion

The results of the present clinical trial suggest that Enviva EO+Butirex treatments have a scarce effect on *Eimeria* but have a role in the improvement of the intestinal health. Both, data recorded from day 1 to 15 and from 30-48 (postinfection and recovery period) suggested a positive role of Enviva EO+Butirex combination in maintaining a good intestinal health. I suggest testing the effect of Enviva EO+Butirex treatment as a complement of the coccidiosis vaccine. An improvement of performance parameters in vaccinated birds supplemented with Enviva EO+Butirex could be expected; moreover, the combination Enviva EO+Butirex could be considered as a replacer of anticoccidials in vaccinated birds.

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