NATURAL ALTERNATIVES TO COCCIDIOSTAT IN CHICKENS, USE OF ENVIVA EO (DuPont) AND BUTIREX C4 (NOVATION)

[2] Danisco Animal Nutrition

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Introduction:

Coccidiosis remains one of the biggest causes of loss in poultry and infections can spread incredibly fast in a few days. Effective use of anticoccidial drugs provided rapid growth of the poultry industry but Eimeria has developed resistance to all the coccidial drugs. Since the EU has banned the use of several anticoccidial drugs and regulations will be tightened gradually there is a need to search into new methods of control. As part of this effort we tested Enviva+Butirex for their capacity to provide protection against coccidiosis. This experiment was designed to determine the sensitivity of a recent field isolate of Eimeria spp to several in-feed doses of Enviva+Butirex.

Material and Methodology:

392 one-day old Cobb 500 birds were distributed in 4 treatments * 7 pens (14 birds/ m^2). Control group (C) contained Maxiban (1-21 days), Monteban (22-48 days) at authorized dosages. Three other groups were treated with Enviva EO+Butirex C4 (1-48 days) (see Table 1). All birds were orally inoculated on day 15 with 0.5 ml solution containing sporulated oocysts of *Eimeria* (*1 *10^5 cfu E. acervulina, 1 *10^4 cfu E. tenella, 5 *10^4 cfu E. maxima)*. On days 25, 35 and 48 we measured performance, oocyst excretion and intestinal lesion scoring as well as clinical observations.

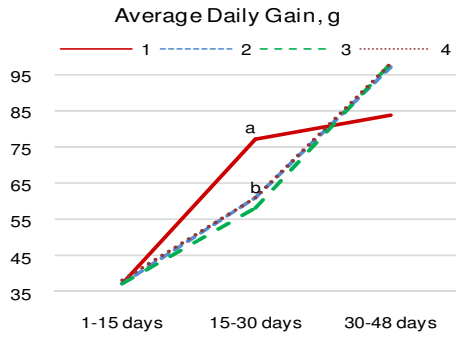
Treatments	
1	Coccidiostat Maxiban 0-21; Monteban 22-48 d
2	100 gr/ton Enviva EO +750 gr/ton Butirex 0-48 d
3	200 gr/ton Enviva EO +750 gr/ton Butirex 0-48 d
4	100 gr/ton Enviva EO +1500 gr/ton Butirex 0-48 d

Diets were nutrtitionally adequate and given in mash (starter: 0-10 days), small pellet (starter: 11-21 days) and standard pellet (grower: 22-48 days). No other additive rather than the tested products were used throughout the trial. Feed and water were provided *ad libitum*. Feed conversion, body weight and mortality were measured at different periods reflecting the economic impact of coccidiosis. Intestinal lesion scoring (0: no lesions; 4: severe lesions) of sacrificed birds and oocysts counts in litter (sampled days 25, 35 and 48) were measured (21, 35 and 48 days) to analyse the health effect in the coccidiosis control.

Performance Results:

Average Weight Gain (AWG), Average Daily Gain (ADG) and Feed Conversion Rate (FCR) were significantly ($p<0.001$) improved in birds fed with Maxiban-Monteban compared to all Enviva+Butirex treatments after two weeks post infection. However, all three Enviva+Butirex treatments improved numerically AWG and FCR in periods 1-15 and 30-48 days compared to Maxiban-Monteban. Overall (1-48 days), no significant differences were detected for any of the performance parameters measured among treatments.

Tto	Average weight gain (g)			Average daily gain (g)			Feed Conversion Rate		
Days	1-15	15-30	30-48	1-15	15-30	30-48	1-15	15-30	30-48
1	517	1160 a	1541	37	77 a	84	1.41	1.49 a	3.00
2	523	908 b	1753	37	61 b	97	1.36	1.77 b	2.75
3	521	869 b	1769	37	58 b	98	1.41	1.84 b	2.71
4	533	909 b	1768	38	61 b	98	1.35	1.95 b	2.75
P	0.28	<0.0001	0.69	0.28	<0.0001	0.12	0.16	0.002	0.23



Clinical Results:

Almost a week post infection Maxiban-Monteban treated birds showed a logical significant ($p<0.0001$) lower lesion score throughout the intestine; however, 20 days post infection only 7 birds (treatments 1 and 3) showed slight lesions in the caeca and no lesions at all in the whole of the intestinal tract. At the very end of the trial (48 days) there were no lesions for any of the 4 treatments, demonstrating an excellent intestinal recovery effect of the Enviva+Butirex treatments.

	Coccidiosis lesion scoring at 6 d post infection in intestine			Coccidiosis lesion scoring at 20 d post infection in intestine		
Tto.	Upper	Middle	Caecal	Upper	Middle	Caecal
1	0.1 a	0.0 a	0.3 a	0.0	0.0	0.3 ab
2	2.3 b	1.4 b	2.6 b	0.0	0.0	0.0 a
3	2.3 b	1.7 b	2.7 b	0.0	0.0	0.4 b
4	2.1 b	1.7 b	2.5 b	0.0	0.0	0.0 a
P (X^2)	<0.0001	<0.0001	<0.0001	1	1	0.015

Conclusions:

✓ Results showed better performance post-infection when Maxiban-Monteban was added to the diet.
✓ Both before the infection (1-15 days) and well after it (30-48 days) the Enviva+Butirex treatments improved performance numerically over the Maxiba-Monteban treatment.
✓Clinically, Maxiban-Monteban showed significant lower lesion scores but Enviva-Butirex treatments managed to recover birds from the infection demonstrated by showing no lesions only 20 days pot-infection.
✓ Overall, we can suggest the combination Enviva+Butirex had no ffect on Eimeria infection but showed great potential recovering coccidia-infected birds as seen by global performance alongside with no intestinal lesions at the end of the trial.

Home message:

✓Enviva+Butirex combination showed a positive effect restoring coccidia-damaged intestinal wall while at the same time reducing possible secondary pathogenical infections (E. coli, Clostridium); based on this trial results, we believe it could play a beneficial role in coccidia vaccinated flocks. A maintenance (or improvement) of performance in the latter can be expected when fed with the combination of Enviva+Butirex.