Aviax® Plus

Technical Bulletin

Information from Phibro Technical Services

Lesion scoring and coccidiosis-related mortality results. Comparison between Aviax® Plus and other commercial combinations of nicarbazin with ionophores in broiler chickens in a floor-pen study

Phibro Internal Code: Study BRT-134-127

Introduction

The presence of coccidiosis in broiler chicken flocks is a constant in the poultry industry (Shirley, M.W., 1994) resulting in reduced performance and, consequently, a higher cost of production Currently, there are products available combining nicarbazin, a chemical coccidiostat, with an anticoccidial ionophore.

Nicarbazin, a widely used coccidiostat, acts during the asexual stage of the *Eimeria* life cycle as the parasites are infecting intestinal cells. Invasive coccidia are deprived of their energy source by interference with fundamental processes needed for the parasite's electron transportation system, thus killing the *Eimeria* parasite.Semduramicin is the most recently developed ionophore and is an effective product against *Eimeria maxima*. The goal of this floor-pen study was to compare the efficacy of Aviax® Plus, a coccidiostat containing nicarbazin and semduramicin, and other commercial combinations of nicarbazin and ionophores fed according to approved indications and challenged with a mixed infection of *Eimeria* spp. in broiler chickens.

Materials and Methods:

Three thousand five hundred (3,500) male Cobb chicks were used in 7 treatments (Table 1), each with 10 replications in a randomized block design. Evaluations were carried out from days 0 to 28, comparing diets with commercial combinations of nicarbazin and ionophores. The trial also included an infected, unmedicated control group.

On day 17 of the study, birds were inoculated through the feed with a highly concentrated mixture of sporulated oocysts of *Eimeria acervulina*, *E. maxima* and *E. tenella* as a severe challenge. Strains of each *Eimeria* species (obtained from Brazilian broiler farms) were grown separately before being added to the inoculum. On day 23, six days post-inoculation, four chickens were removed from each pen, humanely euthanized and evaluated using the coccidiosis lesion scoring system described by Johnson and Reid (1970).

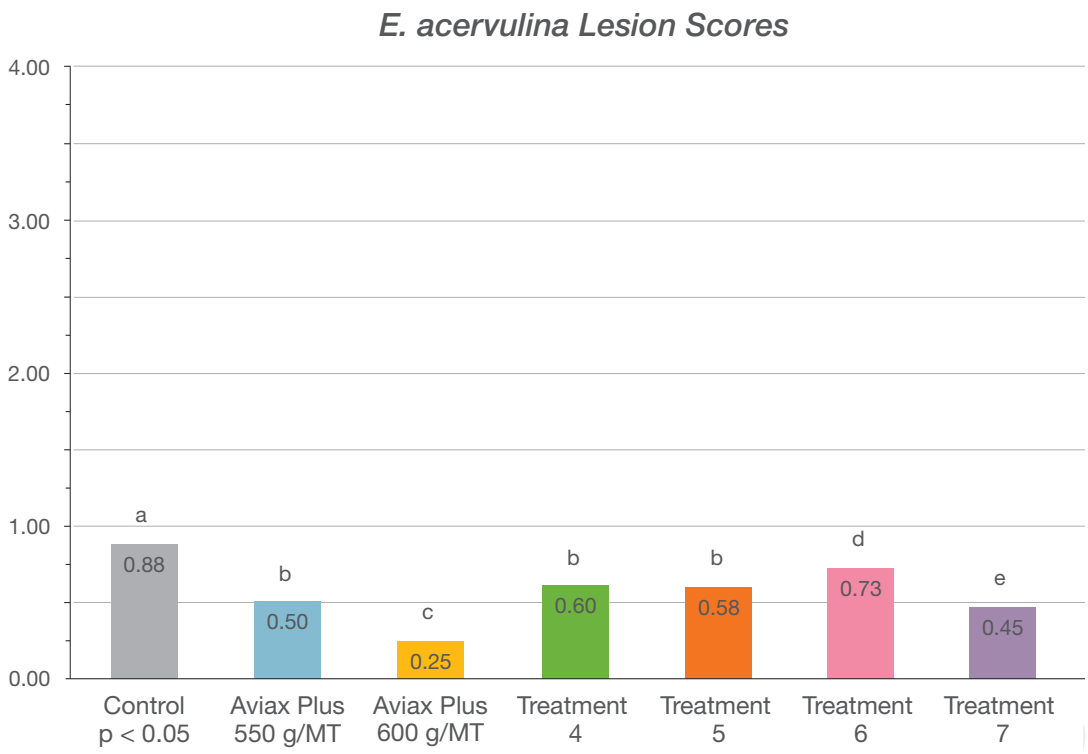
Table 1. Treatments

Treatment Number	Combination product fed 0-28 Starter feed days 0-21 and grower feed days 21-28
1	Untreated controls
2	Aviax® Plus 550 g/MT – 44 ppm nicarbazin & 16.5 ppm semduramicin
3	Aviax® Plus 600 g/MT – 48 ppm nicarbazin & 18 ppm semduramicin
4	Product A 625 g/MT - 50 ppm nicarbazin & 50 ppm narasin
5	Product B 500 g/MT - 40 ppm nicarbazin & 3.75 ppm maduramicin
6	Product C 625 g/MT - 50 ppm nicarbazin & 50 ppm monensin
7	Product D 500 g/MT - 50 ppm nicarbazin & 50 ppm salinomycin

All treatments included virginiamycin (Stafac 500) at 16.5 ppm from days 0-28

Results and Discussion

Figure 1



Aviax® Plus 550 g/MT – 44 ppm nicarbazin & 16.5 ppm semduramicin
Aviax® Plus 600 g/MT – 48 ppm nicarbazin & 18 ppm semduramicin
Treatment 4 – 625 g/MT – 50 ppm nicarbazin & 50 ppm narasin
Treatment 5 – 500 g/MT – 40 ppm nicarbazin & 3.75 ppm maduramicin
Treatment 6 – 625 g/MT – 50 ppm nicarbazin & 50 ppm monensin
Treatment 7 – 500 g/MT – 50 ppm nicarbazin & 50 ppm salinomycin

Averages with different letters are statistically significant by the Tukey test ($p < 0.05$)

- Aviax Plus 600 g/MT had the statistically significant lowest lesion score with *E. acervulina* coccidiosis challenge.
- Given that salinomycin is often considered the most powerful ionophore against *Eimeria acervulina*, the performance of Aviax Plus 600 g/MT is especially impressive.

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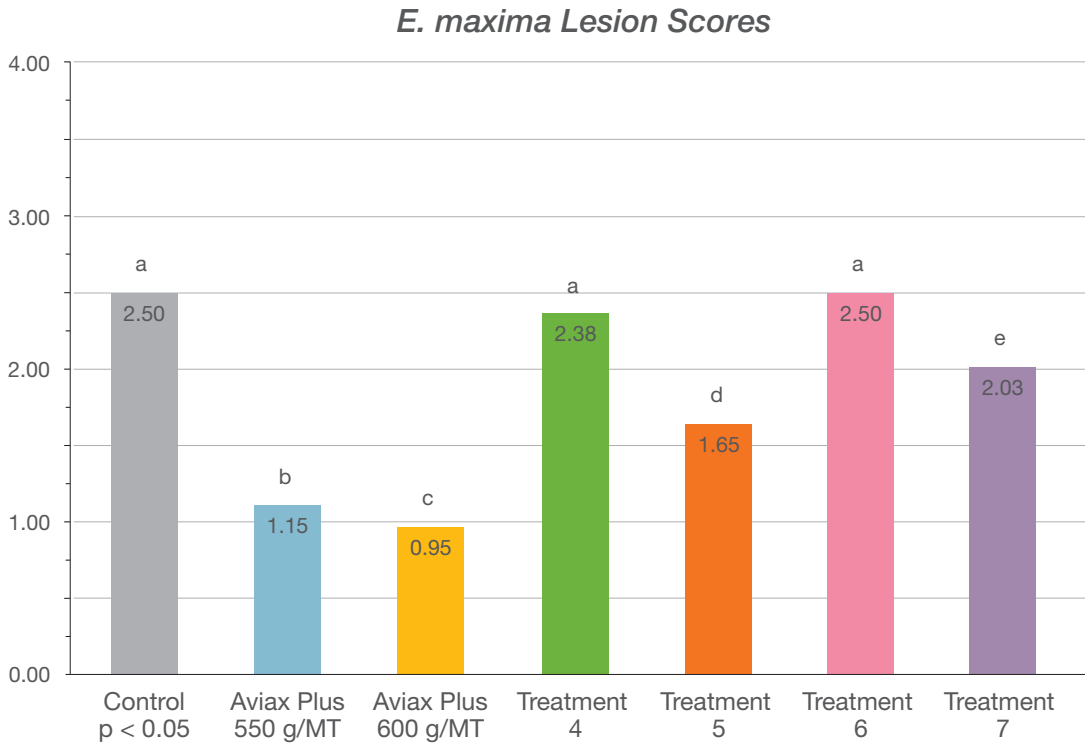
Figure 2



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Treatment 6 – 625 g/MT – 50 ppm nicarbazin & 50 ppm monensin
Treatment 7 – 500 g/MT – 50 ppm nicarbazin & 50 ppm salinomycin

Averages with different letters are statistically significant by the Tukey test ($p < 0.05$)

- Both Aviax Plus doses had statistically significant reductions in *E. maxima* lesions compared to all other treatments.
- This study confirms the observation that semduramicin is the most powerful ionophore against *E. maxima*.
- Treatments 4 and 6 did not statistically differ from the control group showing little efficacy against *E. maxima* infection.

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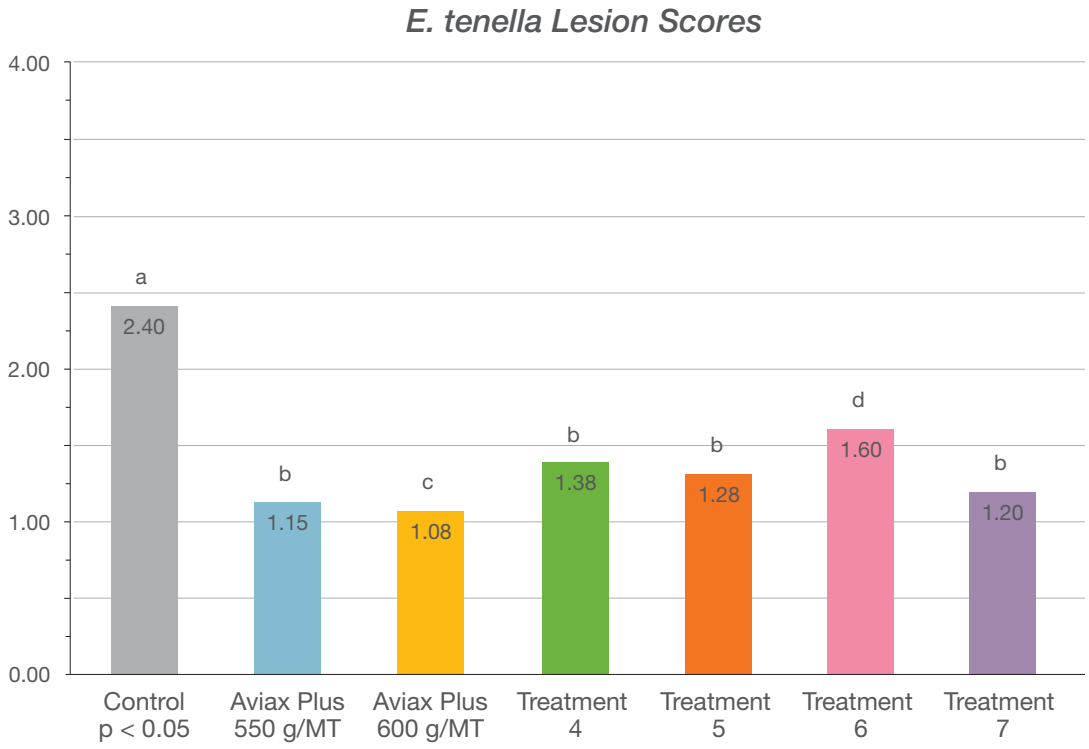
Figure 3



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Treatment 6 – 625 g/MT – 50 ppm nicarbazin & 50 ppm monensin
Treatment 7 – 500 g/MT – 50 ppm nicarbazin & 50 ppm salinomycin

Averages with different letters are statistically significant by the Tukey test ($p < 0.05$)

- Aviax Plus 600g/MT had statistically significant lower lesion scores for *E. tenella*.
- Given that maduramicin is often considered the most powerful ionophore against *Eimeria tenella*, the performance of Aviax Plus 600 g/MT is especially impressive.
- Aviax Plus 500 g/MT and Treatments 4 and 6 also had statistically similar results as Treatment 5 containing maduramicin.

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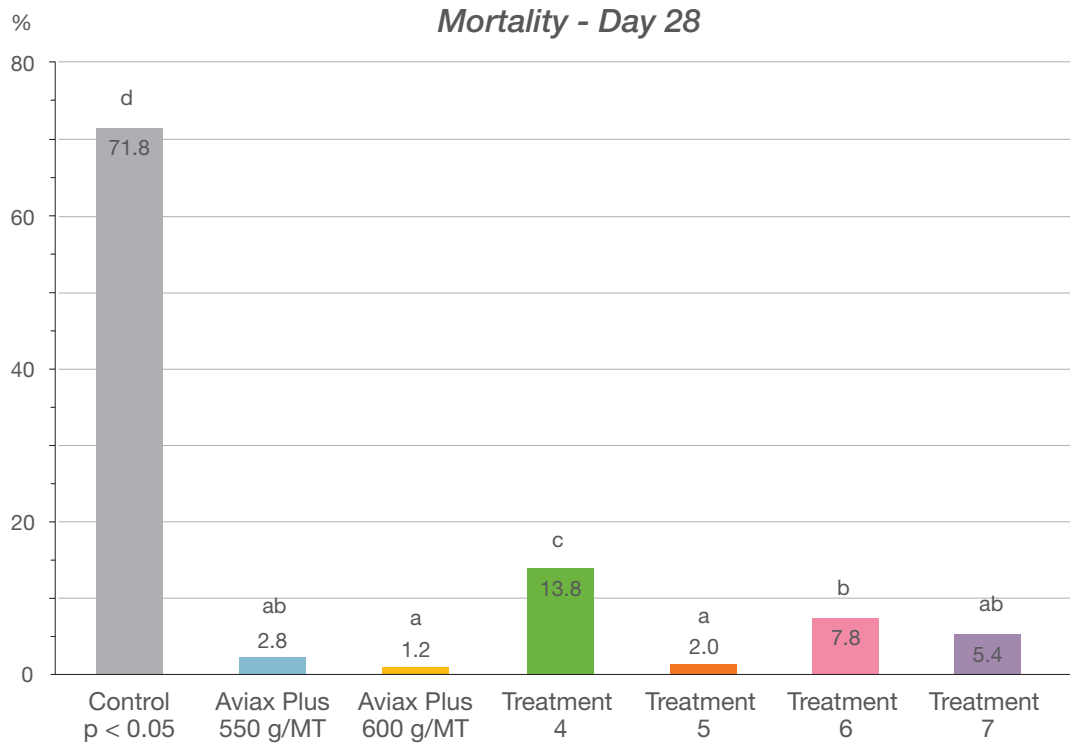
Figure 4



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Averages with different letters are statistically significant by the Tukey test ($p < 0.05$)

- Both Aviax Plus groups, as well as Treatments 5 and 7, were most efficient to control mortality.
- Treatment 4 had statistically significantly higher mortality due to infection indicated by high lesion scores from *E. maxima*.

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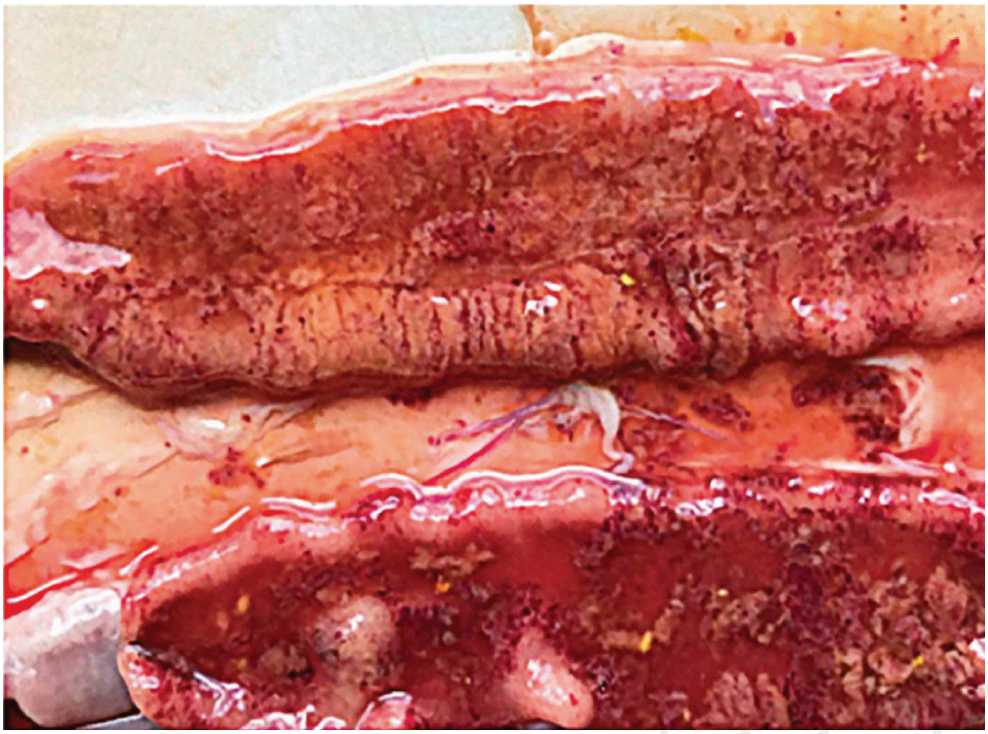

Image 1: E. maxima + necrotic enteritis
Source: Study BRT 134-127

Final Conclusions

Aviax Plus 600 g/MT showed statistically significant better results in the control of *Eimeria maxima*, *E. acervulina* and *E. tenella* infections compared to other treatments. Aviax Plus 550 g/MT had statistically better protection against Eimeria maxima than other combination products and statistically similar results as the maduramicin combination (maduramicin is the reference ionophore for *E tenella*).

Aviax Plus in the two evaluated doses, nicarbazin plus maduramicin and nicarbazin plus salinomycin all had statistically better mortality control and differed statistically from the control of nicarbazin plus narasin and nicarbazin plus monensin.

References

Shirley M.W. Coccidial parasites from the chicken: discrimination of different populations of *Eimeria tenella* by DNA hybridization. Res Vet Sci. 1994:57:10–14.

Johnson J., Reid W.M. Anticoccidial drugs: lesion scoring techniques in battery and floor-pen experiments with chickens. Exp Parasitol. 1970 Aug:28(1):30-6.

This information has been prepared for industry technical professionals.