Aviax® Plus

Technical Bulletin

Information from Phibro Technical Services

Production performance 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, 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. The goal of this floor-pen study is 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.

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 an 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.

Materials and Methods:

Three thousand five hundred (3,500) male Cobb chicks were used in 7 treatments (Table 1) each with 10 replicate blocks in a randomized block design. Evaluations were carried out from days 0 to 28, comparing diets with commercial combinations of nicarbazin and ionophores. This 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*, *Eimeria maxima* and *Eimeria tenella* simulating as a severe field challenge. Strains of each *Eimeria* species (obtained from Brazilian broiler farms) were grown separately before being added to the inoculum.

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

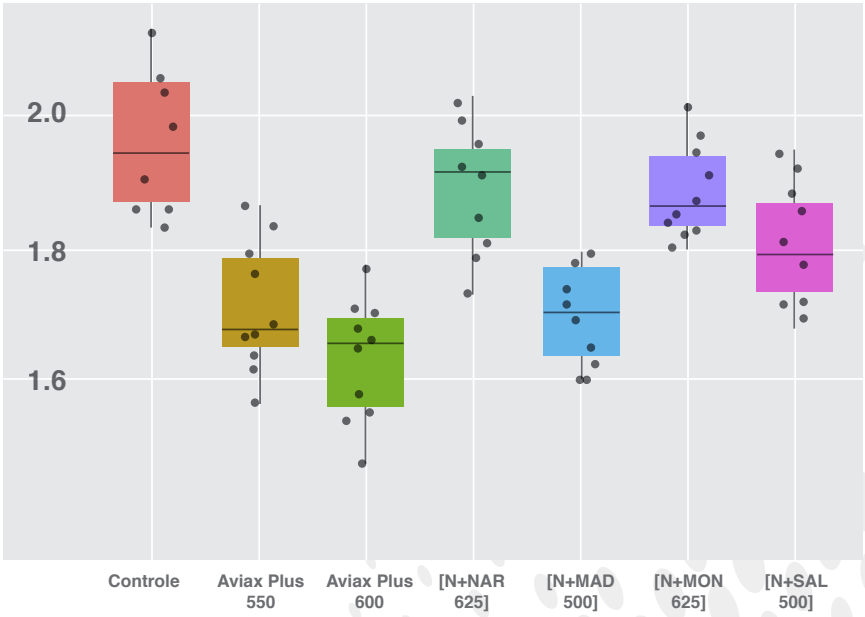
Results and Discussion

The performance data (Feed Conversion, Total Weight of Birds by Pen and Livability) from days 0 to 28 are presented in box plot charts. These graphic tools are used in descriptive statistics to display variations of data observed in a trial (Charts 1 to 3).

General instructions to interpret the data in a box plot will be explained using Chart 1 as an example:

- The plotted points for each treatment are the average feed conversion of each treatment replicate (10 replicates per treatment).
- The black vertical line for each treatment indicates data dispersion of feed conversion.
- The horizontal line inside the box for each treatment is the median (a value that separates the largest and smallest halves of a data set).

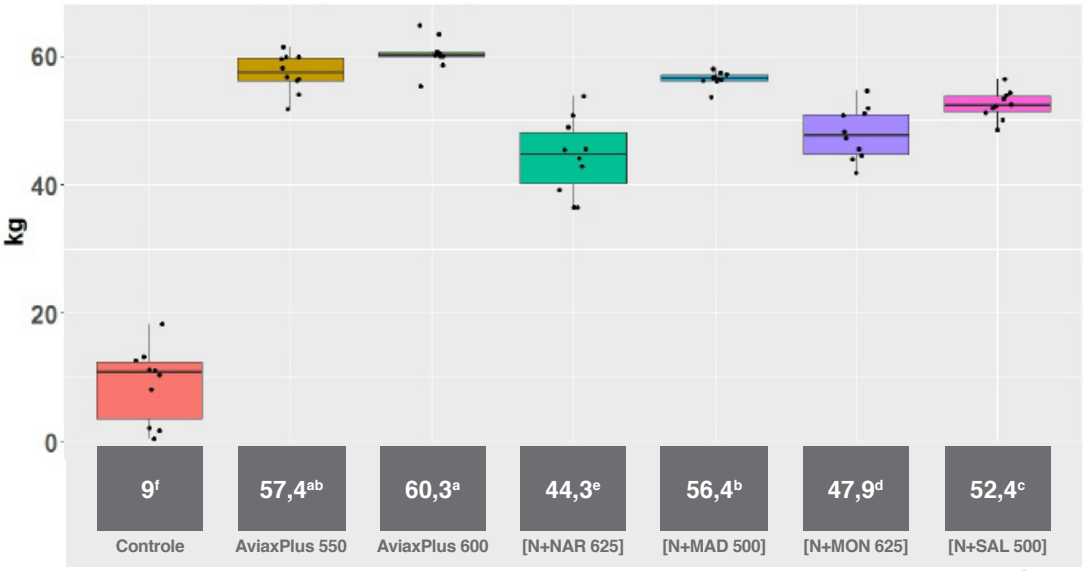
Chart 1. Feed Conversion – Day 28



Aviax Plus 600 g/MT had statistically significant lower feed conversion than other treatments and was also related statistically with the Aviax Plus 550 g/MT group.

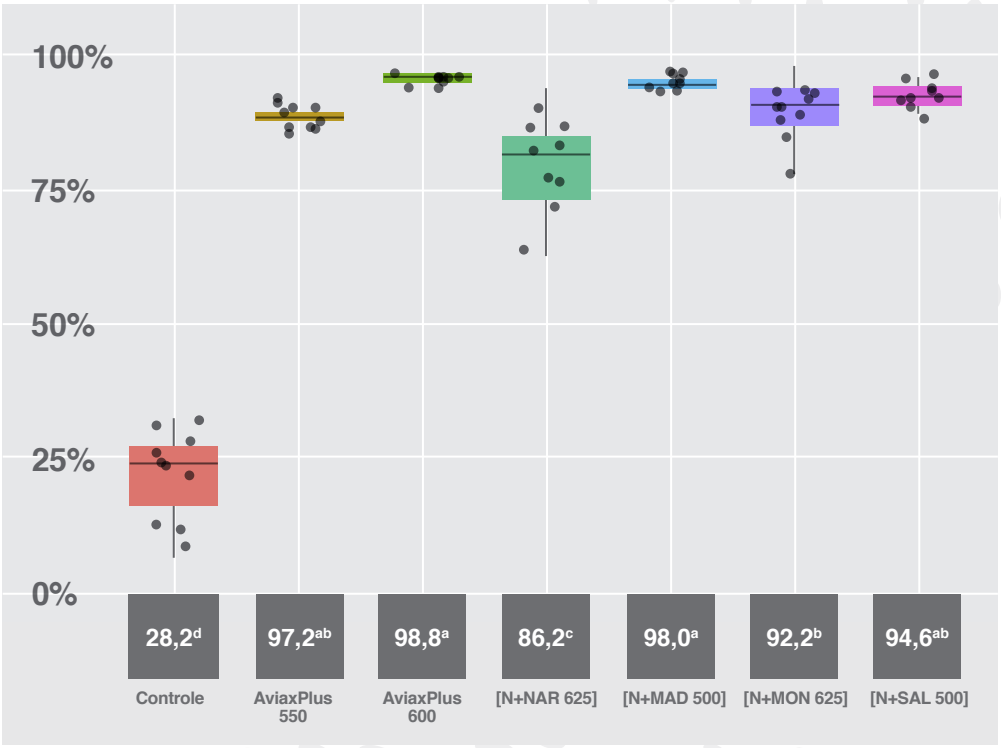
The combination of nicarbazin and narasin did not differ statistically from the untreated control group.

Chart 2. Total Pen Weight (kg) – Day 28



The Aviax Plus 600 g/MT pen had the highest weight with a statistically significant difference. Also, the Aviax Plus 550 g/MT pen was second heaviest and was statistically related to the Aviax Plus 600 g/MT pen.

Chart 3. Livability – Day 28



The Aviax Plus 600 g/MT and nicarbazin and maduramicin treatments had the highest livability, followed by Aviax Plus 550 g/MT and nicarbazin and salinomycin.

Comparing the Total Pen Weight and Livability among all of the other treatment groups shows a lack of

coccidiosis control (specifically, the nicarbazin and narasin treatment and the nicarbazin and monensin treatment). Also, this resulted in lighter pen weights and lower feed conversion ratios.

Comparing the Total Pen Weight and Livability among all of the other treatment groups shows a lack of

coccidiosis control (specifically, the nicarbazin and narasin treatment and the nicarbazin and monensin treatment). Also, this resulted in lighter pen weights and lower feed conversion ratios.

Final Considerations

This study with a severe coccidiosis challenge showed that Aviax Plus (combination of nicarbazin and semduramicin) best controlled the infection and mortality from *E. tenella* and *E. maxima* resulting in better feed conversion, total pen weight and livability.

Aviax Plus, in both evaluated dosages, was the treatment with the best performance for all the evaluated parameters (Feed Conversion, Total Pen Weight and Livability). Aviax Plus 600 g/MT outperformed Aviax Plus 550 g/MT in the each of the evaluated parameters.

*The lesion scoring data of *Eimeria* strains and mortality from this trial are presented in the Technical Newsletter "Lesion scoring and coccidiosis-related mortality results".

Bibliography

Shirley M.W. Coccidial parasites from the chicken: discrimination of different populations of Eimeria tenella by DNA hybridisation. 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.