

Multi-study analysis on the efficacy of nicarbazin/monensin, a novel coccidiostat for use in broilers

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Summary

The objective of this multi-study analysis was to compare the efficacy of Monimax® (nicarbazin/monensin) and nicarbazin/narasin against a variety of different *Eimeria* strains. Data of 27 different anticoccidial sensitivity tests (ASTs) conducted over a 7-year period (2013-2019) were included in this study. The *Eimeria* isolates originated from commercial broiler farms from 13 different countries worldwide applying different coccidiostat control programs. From this analysis of 27 studies, it can be concluded that Monimax® resulted in significant reduction of all *Eimeria* species lesions and all measured performance parameters compared to the IUC. When comparing Monimax® with nicarbazin/narasin all performance results are numerically higher and *E. acervulina* and *E. maxima* lesion were significantly lower.

Introduction

Coccidiostats remain an essential tool in the prevention and control of coccidiosis, still one of the most important diseases contributing to gut health disorders. Combination products are frequently used in different shuttle programmes and the goal of the multi-study analysis is to re-evaluate the efficacy of 2 frequently used combination products.

Method

Two research institutes, using a comparable standardized AST protocol, conducted the trials. Birds were reared without coccidiostats until 14 days of age after which they were allocated to the different groups. Monimax® treated birds were compared to an infected untreated control (IUC), uninfected untreated control (UUC) and birds treated with nicarbazin/narasin. Birds were supplemented with Monimax® or nicarbazin/narasin at the same inclusion rate (40/40 - 50/50 ppm) starting 2 days before oral inoculation. Between 5-7 days after inoculation lesions scores and performance (daily weight gain (DWG), daily feed intake (DFI) and feed conversion ratio (FCR)) was measured and compared to an uninfected, untreated control group (UUC) and an infected, untreated control group (IUC). A multivariate mixed general linear models, including research institute as covariate and including the trial as a random effect was used. Results were further evaluated with multivariable mixed logistic regression model.

Results

The Monimax® group showed a significant reduction for all species (*E. acervulina*, *E. maxima* and *E. tenella* respectively 1.69, 0.93 and 1.38) compared to the IUC (respectively 2.02, 1.20 and 1.81). Nicarbazin/narasin did not result in a significant reduction of *E. acervulina* (Lesion scores: 1.98 for *E. acervulina*, 1.04 for *E. maxima* and 1.44 for *E. tenella*) compared to IUC. Monimax® showed significant lower *E. acervulina* and *E. maxima* scores compared to nicarbazin/narasin.

Table 1. Lesion scoring results for the different treatment groups

Group	<i>E. acervulina</i>	<i>E. maxima</i>	<i>E. tenella</i>
IUC	2.02a	1.2a	1.81a
UUC	0.34d	0.48d	0.49c
Monimax®	1.69c	0.93c	1.38b
Nicarbazin/narasin	1.98a	1.04b	1.44b

Different letters indicate significant difference between treatments with p<0,01

Monimax® resulted in significantly improved DWG, DFI and FCR (respectively 55.0g, 90.2g and 1.72) compared to the IUC (respectively 46.0g, 87.1g and 2.07). Monimax® resulted in better numerical performance compared to the nicarbazin/narasin combination product (respectively 53.8g, 89.2g and 1.75).

Table 2. Performance results for the different treatment groups

Group	DWG (in g)	DFI (in g)	FCR
IUC	46c	87.1c	2.07c
UUC	67.0a	97.4a	1.47a
Monimax®	55b	90.2b	1.72b
Nicarbazin/narasin	53.8b	89.2bc	1.75b

Different letters indicate significant difference between treatments with p<0,01

Discussion

From this analysis of 27 studies, it can be concluded that Monimax® resulted in significant reduction of all *Eimeria* species lesions and all measured performance parameters compared to the IUC. When comparing Monimax® with nicarbazin/narasin all performance results are numerically higher. Nicarbazin/narasin did not significantly reduce lesion of *E. acervulina* compared to the IUC and lesions for *E. acervulina* and *E. maxima* were significantly higher compared to birds supplemented with Monimax®. The finding that nicarbazin/narasin did not result in a significant reduction of *E. acervulina* lesions after infection is in contrast to earlier findings of Long and colleagues (1988) where the nicarbazin/narasin combination showed efficacious control of coccidiosis. A potential explanation is that reduced sensitivity of the *Eimeria* field strains due to long-term use of both compounds over the years has attributed to the less positive results in comparison to the older work.

References

Holdsworth PA, Conway DP, McKenzie ME, Dayton AD, Chapman HD, Mathis GF, Skinner JT, Mundt HC & Williams RB (2004) *Veterinary Parasitology* **121**: 189-212.

